TRANSACTIONS

AMERICAN ACADEMY
of
OPHTHALMOLOGY
and
OTOLARYNGOLOGY

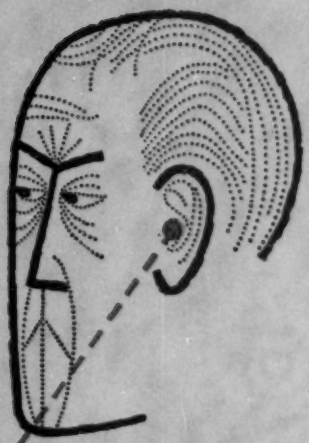
MAY - JUNE
1957

Volume 61 No. 3

ANNUAL MEETING, OCTOBER 13-18, 1957, CHICAGO

Now Even Greater Effectiveness

in EAR CANAL THERAPY



Otamylon® c Hydrocortisone EAR DROPS

BACTERICIDAL
FUNGICIDAL
ANALGESIC
HYGROSCOPIC

Anti-allergic • Anti-inflammatory

for OTITIS EXTERNA
FURUNCULOSIS
OTOMYCOSIS
OTITIS MEDIA

Excellent Topical Tolerance • No Systemic Effects

The addition of hydrocortisone to the Otamylon formulation greatly enhances its effectiveness against infectious processes involving the ear canal and ear drum. Exudation, erythema, itching and sensation of fulness subside rapidly.

Otamylon with Hydrocortisone is effective against all commonly encountered ear pathogens.

Otamylon with Hydrocortisone is a clear, odorless, sterile, viscid liquid containing:

Sulfamylon® HCl	5%
Benzocaine	5%
Hydrocortisone	0.02%
Anhydrous glycol q.s.	100

Manner of Use: 2 or 3 drops or moistened wick applied three or four times daily.

Supplied: Combination package with dropper: Otamylon (13.4 cc.) and hydrocortisone solution (2 cc.) to be mixed prior to dispensing.

Also available for highly effective topical chemotherapy on skin, mucous membranes, etc., and in peritoneal cavity:

Sulfamylon 5% solution (1 fl. oz. and 8 fl. oz.)

Sulfamylon with Streptomycin—5% solution (100 cc.) with streptomycin 20 mg. (20,000 units).

Winthrop LABORATORIES
NEW YORK 18, N. Y.

Otamylon and Sulfamylon (brand of mafenide), trademarks reg. U.S. Pat. Off.

TRANSACTIONS

American Academy of Ophthalmology and Otolaryngology

VOLUME 61 MAY - JUNE, 1957 NUMBER 3

TABLE OF CONTENTS

PAGE

THE TREATMENT OF EXTERNAL OTITIS: THE DERMATOLOGIST'S VIEWPOINT.. 343
ELDON T. PERRY, M.D., Med. Sc. D.

WHAT'S NEW IN THE TREATMENT OF OTITIS EXTERNA: THE OTOLOGIST'S VIEWPOINT..... 347
BEN H. SENTURIA, M.D.

MUCOLYTIC AEROSOLS: THEIR USE IN RESPIRATORY DISEASES..... 360
JOSEPH B. MILLER, M.D.

ADVANCED CARCINOMA OF THE LARYNX AND HYPOPHARYNX: SURGICAL EXPERIENCES 371
MAURICE F. SNITMAN, M.D., and ARTHUR LOEWY, M.D.

SYMPOSIUM: ACCOMMODATIVE ESOTROPIA

RELATIONSHIP BETWEEN ACCOMMODATION AND CONVERGENCE..... 375
GOODWIN M. BREININ, M.D.

CLASSIFICATION AND DIAGNOSIS..... 383
KENNETH C. SWAN, M.D.

PRINCIPLES OF TREATMENT..... 390
FRANK D. COSTENBADER, M.D.

SUMMARY AND CONCLUSIONS..... 395
KENNETH C. SWAN, M.D.

MALIGNANT MELANOMA IN THE TEMPORAL PERIPHERY ASSOCIATED WITH MACULAR SYMPTOMS AS AN INITIAL FINDING..... 397
WILFRED E. FRY, M.D., and P. ROBB McDONALD, M.D.

EYE PROTECTION AGAINST SMALL HIGH-SPEED MISSILES..... 404
H. W. ROSE, M.D., and GEORGE M. STEWART

(Continued on Next Page)

Printed bimonthly, February, April, June, August, October and December, by the Douglas Printing Company, 109 North 18th Street, Omaha 2, Nebraska, for the American Academy of Ophthalmology and Otolaryngology. Editorial and business office, 15 Second Street S.W., Rochester, Minnesota. Subscription price, $10.00 yearly. Second class mail privileges authorized at Omaha, Nebraska.

TABLE OF CONTENTS *(Continued)*

PAGE

NEW INSTRUMENTS

A Proximally Illuminated Bronchoscopic Telescope Utilizing Quartz-Rod Light Transmission 411
Paul H. Holinger, M.D., and Kenneth C. Johnston, M.D.

The Seltzer Nasometer for Measuring Nasal Patency 413
Albert P. Seltzer, M.D.

Fixator for the Version Test 415
Walter H. Fink, M.D., and Robert J. Fink, M.D.

A Lacrimal Probe-Needle 416
Orwyn H. Ellis, M.D.

An Improved Needle Holder 419
Orville E. Gordon, M.D.

In Memoriam 420

EDITORIALS

The Alumni Dinner Meetings 421

The Annual Meeting of the International Council of Ophthalmology 422

Industrial Noise and Hearing Loss 425

Financial Report 428

International Association of Secretaries of Ophthalmological and Otolaryngological Societies:

Present Direction and Future Aims 435

Asia-Pacific Academy of Ophthalmology 436

Book Review 438

News Notes XXVII

Positions Available XXIX

Section on Instruction XXX

Directory of Ophthalmologic and Otolaryngologic Societies XLII

highly effective—clinically proved

Sigmamycin*

OLEANDOMYCIN TETRACYCLINE

provides added certainty in antibiotic therapy particularly for that 90% of the patient population treated in home or office...

Multi-spectrum synergistically strengthened SIGMAMYCIN provides the antimicrobial spectrum of tetracycline extended and potentiated with oleandomycin to include even those strains of staphylococci and certain other pathogens resistant to other antibiotics.

Supplied: SIGMAMYCIN CAPSULES – 250 mg. (oleandomycin 83 mg., tetracycline 167 mg.), bottles of 16 and 100; 100 mg. (oleandomycin 33 mg., tetracycline 67 mg.), bottles of 25 and 100. SIGMAMYCIN FOR ORAL SUSPENSION – 1.5 Gm., 125 mg. per 5 cc. teaspoonful (oleandomycin 42 mg., tetracycline 83 mg.), mint flavored, bottles of 2 oz.

*Trademark

PFIZER LABORATORIES, Brooklyn 6, N. Y.
Division, Chas. Pfizer & Co., Inc.
World leader in antibiotic development and production

Pfizer

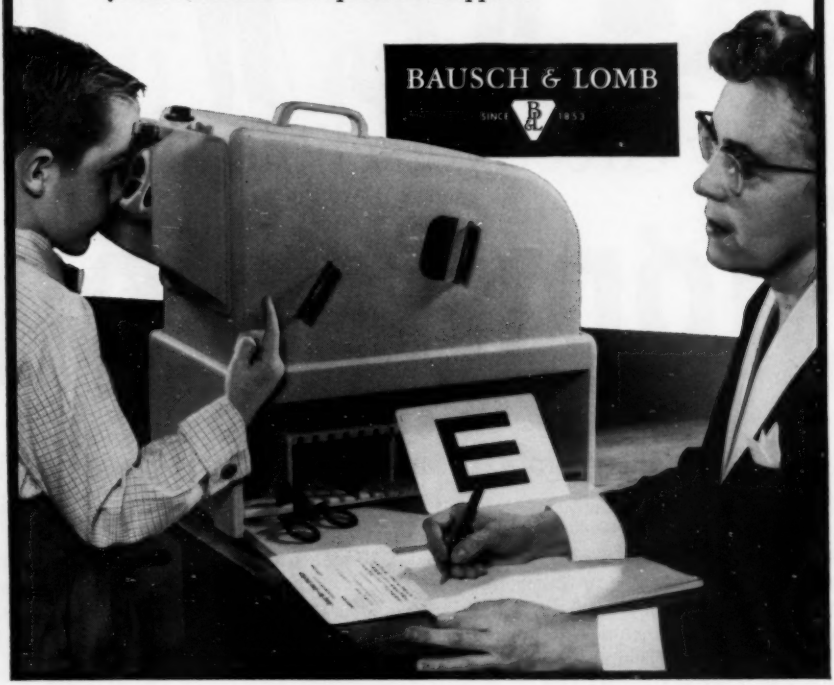
IDENTIFIES PUPILS IN NEED OF VISUAL ATTENTION

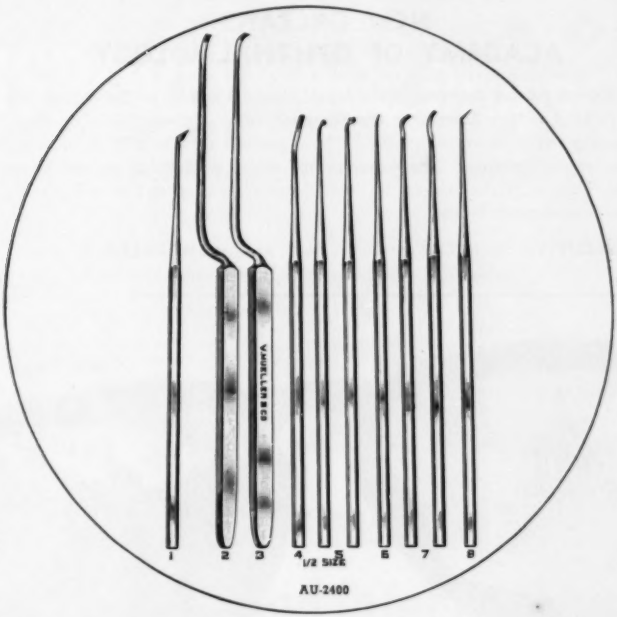
School Vision Tester

Helps show school administrators, pupils, parents . . . the importance of professional eye care

With a series of positive, accurate tests, including the recommended Massachusetts type, the "New York" School Vision Tester identifies pupils who need professional eye care.

Outstanding benefit to schools is its simplicity, compactness, reliability and ease of use. Tests are professionally approved, mechanically correct and psychologically sound. For information as to use of the School Vision Tester in your area, call your Bausch & Lomb ophthalmic supplier.





New Rosen Instrument Set

For Stapes Mobilization

V. Mueller Catalog Number—AU-2400. 10 instruments in khaki roll.
Price—$44.00

1. Incision knife. For incision through skin over bony canal wall, about 6-7 mm. external to drum.
2. Bayonet Separator. (Lesser curve.)
3. Bayonet Separator. (Full curve.) Skin is separated from bone as far as drum, from beginning of incision.
4. Separator. (Slightly angled.) Drum is finally lifted out of sulcus, reflected upward upon itself like apron.
5. Separators. (Left, small; Right, large.) 2-3 mm. of very edge of posterior bony canal wall is removed, thus exposing the ossicles.
6. Probe. Finely pointed, for testing mobility of footplate of stapes, and for mobilizing the footplate directly at the footplate.
7. Mobilizers. (Left, full curved, narrow; Right, lesser curved, narrow.) For applying variable pressure downward against neck of stapes.
8. Explorer. For use when necessary to sever adhesions involving ossicles.

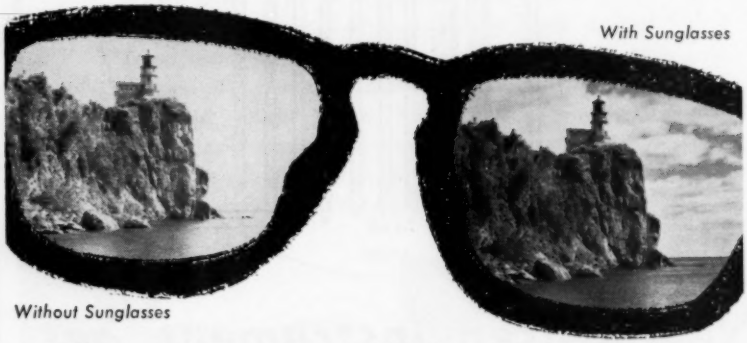
Armamentarium

V MUELLER & CO.
330 South Honore Street
Chicago 12, Illinois
DALLAS • HOUSTON • LOS ANGELES • ROCHESTER, MINN.

NEW ORLEANS ACADEMY OF OPHTHALMOLOGY

The Eighth Annual meeting of the New Orleans Academy of Ophthalmology will be held in New Orleans in the Roosevelt Hotel, February 24-28, 1958, featuring "Symposium on Uveitis." The registration fee of $75.00 includes associate membership in the Academy for the year of 1958, as well as all other features of the convention. Hotel reservations should be made early by writing directly to the

EXECUTIVE SECRETARY, P. O. BOX 469, NEW ORLEANS, LA.



Prescribe year-round
eye comfort for your patients' outdoor activities

More of your patients are spending more of their time out-of-doors than ever before.

As a part of your service of providing complete eye care, we suggest you prescribe sun glasses for year-round eye comfort.

Remember, when you do, BENSON'S stands ready to give you quick, dependable service from the Upper Midwest's largest and most complete stock . . .

G15 • greens 2 and 3 • full lines of A O Calobars and B & L Ray-Bans . . . regular and large size lenses in hundreds of beautifully styled frames (plain or with precious metal trim). *Many tints available in multifocals.*

Since 1913 Benson OPTICAL COMPANY *Executive Offices • Minneapolis 2, Minn.*

COMPLETE LABORATORIES CONVENIENTLY LOCATED IN UPPER MIDWEST CITIES

Antibacterial / Anti-inflammatory

'CORTISPORIN'® BRAND Otic Drops

- Relieves "incessant itching" and inflammation.
- Eradicates *Pseudomonas* and other common causes of otitis.
- Helps restore normal acid mantle.
- ***Rarely sensitizes.***

Contains: 'Aerosporin'® Sulfate Polymyxin B Sulfate, Neomycin Sulfate and Hydrocortisone (free alcohol) in a sterile, slightly acid, aqueous suspension.

Available in dropper bottles of 5 cc.

ecific
erapy

for most inflamed and infected ears

Antibacterial / Antifungal

'AEROSPORIN'® BRAND Otic Solution

- Counteracts "sogginess" of ear canal.
- Eradicates *Pseudomonas* and other common causes of otitis.
- Antifungal for *Monilia* and *Aspergillus.*
- Helps restore normal acid mantle.
- ***Rarely sensitizes.***

Contains: 'Aerosporin'® Sulfate Polymyxin B Sulfate in Propylene Glycol with 1% Acetic Acid.

Available in dropper bottles of 10 cc.

BURROUGHS WELLCOME & CO. (U.S.A.) INC., Tuckahoe, N.Y.

A COMPLETE TREATMENT ROOM IN A SMALL AREA

The dimensions in the above photograph are 5′ 9″ along one wall and 4′ 2″ along the other. In this area, conveniently arranged, is everything needed to make a complete examination. However, it need not be confined to this limited space. The complete absence of piping and wiring is especially noticeable. A number of other arrangements will be furnished on request.

Treatment Stand: Covered with stainless steel. Contains: air regulator with gauge, tubing, cutoff and air filter; nasopharyngoscope rheostat; push button; cautery transformer and rheostat; transilluminator complete with rheostat, cord, handle, lamps, antrum and frontal tips; seven metal drawers on fiber runners and one large drawer for towels; waste container; bakelite covered work table; space for six spray bottles, twelve solution bottles, shelf for cotton jars; pocket for history card or prescription blanks; and a spray bottle heater; the whole presents an attractive appearance and will not tarnish and is easy to keep clean. Price complete without glassware $195.00. Without air but with electrical equipment $165.00. With air equipment only $150.00. Without either air or electrical equipment $115.00. Glassware available.

Chair: Can be placed in horizontal position, will not tip in this position; raised and lowered by large hand wheel; paper covered headrest removable; locked with foot-pedal; bakelite armrests removable. Back locks rigidly in any position. As shown in brown or green. $150.00.

Turning Chair: By adding a footrest and the necessary handles this chair can be used for turning tests. All the additional equipment is easily and quickly removable. Add $30.00.

Combined Suction and Cuspidor: This is an entirely new piece of equipment. It was designed to eliminate the cost of installing a separate suction. The apparatus is 12″ wide and pro,ects 13¼″ from the wall. The flushing rim and the suction is furnished with a vacuum breaker and should meet all plumbing requirements. Stop and trap not furnished. Available in ivory, green and white. Price $95.00.

Ceiling Light: A telescopic light attached to the ceiling. May also be attached to base board in back of chair. Available in 4, 5, 6 and 7 ft. (extended). 4 ft. $16.50 (add one dollar per ft.).

Light Shield: Takes an ordinary 100 watt lamp. Will not burst; spot can easily be rotated. $5.00.

Stool: A soft upholstered stool with easy running ball bearing stem casters. $20.00. Stool with back, $26.00.

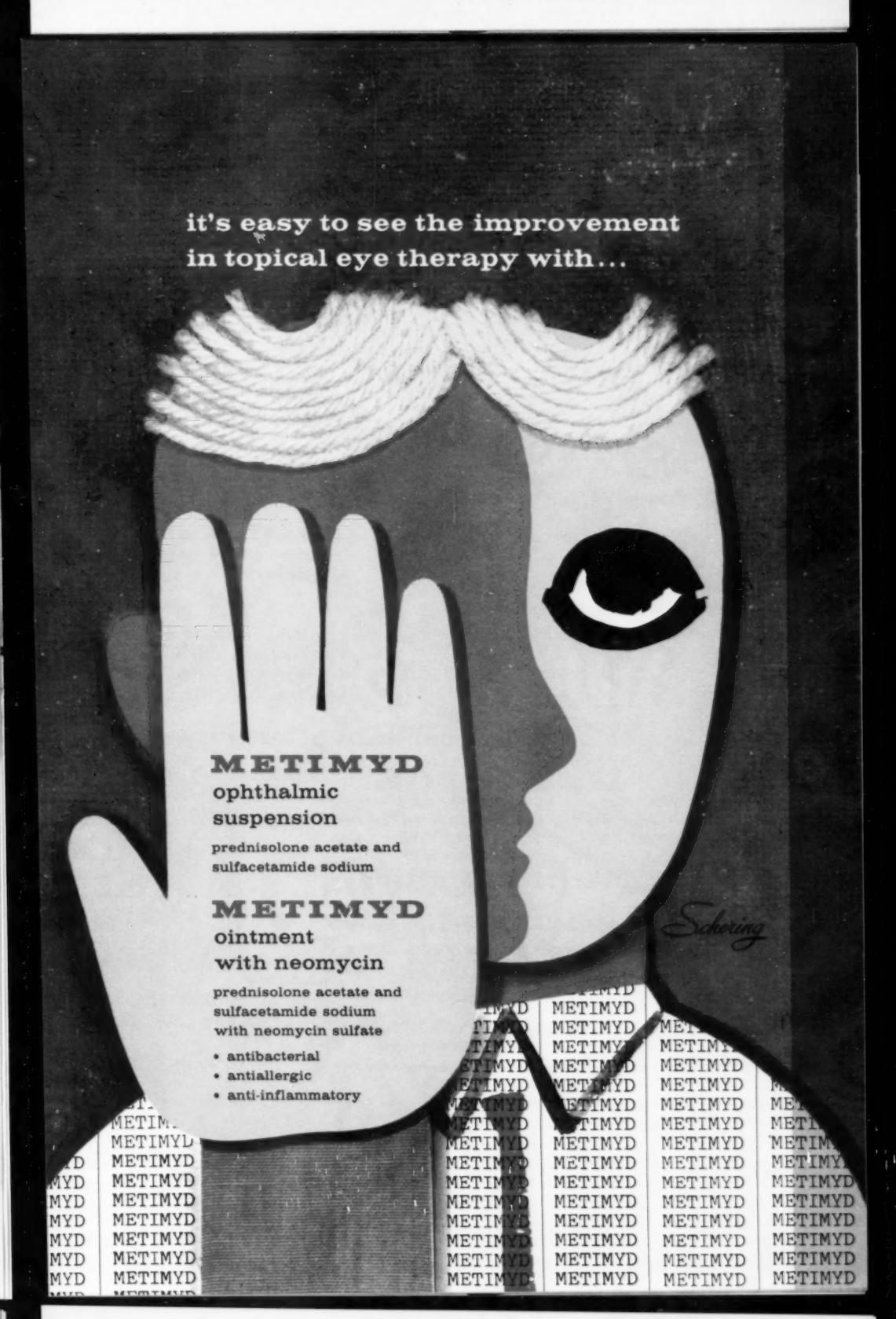
All the equipment shown in this advertisement, ready to be attached to your air system, $531.50.

CATALOG SENT ON REQUEST

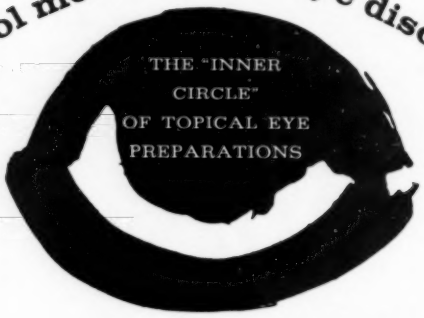
All Prices are F.O.B. Los Angeles, Calif.

Surgical — Mechanical — Research, Inc.

1901-1903-1905 Beverly Blvd. SMR Los Angeles 57, Calif.


it's easy to see the improvement
in topical eye therapy with...
METIMYD
ophthalmic
suspension
prednisolone acetate and
sulfacetamide sodium
METIMYD
ointment
with neomycin
prednisolone acetate and
sulfacetamide sodium
with neomycin sulfate
• antibacterial
• antiallergic
• anti-inflammatory
Schering

to control most "outer" eye disorders...



for inflammation, allergy, infection

METIMYD ophthalmic suspension — combines 0.5% prednisolone acetate and 10% sulfacetamide sodium; 5 cc. dropper bottle.

METIMYD ointment with neomycin — combines 0.5% prednisolone acetate, 10% sulfacetamide sodium, and 0.25% neomycin sulfate; ⅛ oz. applicator tube.

especially for resistant allergies

METRETON ophthalmic suspension — combines 0.2% prednisolone acetate and 0.3% chlorprophenpyridamine gluconate; 5 cc. dropper bottle.

standard for infection

SODIUM SULAMYD

Ophthalmic Solution 30%; 15 cc. dropper bottle.

Ophthalmic Ointment 10%; ⅛ oz. applicator tube.

Ophthalmic Solution 10% with Methylcellulose 0.5%; 15 cc. dropper bottle.

Schering

METIMYD,® brand of prednisolone acetate and sulfacetamide sodium.
METRETON,® brand of corticoid-antihistamine compound.
Sodium SULAMYD,® brand of Sulfacetamide Sodium U.S.P.

MM-J-257

METIMYD METIMYD METIMYD METIMYD METIMYD METIMYD

NEW

True solution
assures
maximum
anti-inflammatory
benefits

STERILE
OPHTHALMIC
SOLUTION

'NEO-HYDELTRASOL'

(PREDNISOLONE 21-PHOSPHATE–NEOMYCIN SULFATE)

Now you can offer your patient needing topical therapy the *unequalled benefits* of the first stable, sterile soluble "predni-steroid" *in true solution.* Sterile Ophthalmic Solution 'NEO-HYDELTRASOL' contains a soluble inorganic ester of the most potent "predni-steroid"—prednisolone 21-phosphate. 'NEO-HYDELTRASOL' provides *these exclusive advantages:*

- **freedom from any particulate matter capable of injuring ocular tissues.**
- **uniform and effective concentrations of prednisolone.**
- **compatibility with ocular tissues and fluids.**
- **stability for long periods (does not need refrigeration).**

Indications: Allergic and inflammatory lesions of the anterior segment; injury due to physical or chemical trauma.

Contraindications: Ocular herpes simplex and ocular tuberculosis.

Supplied: *Sterile Ophthalmic Solution* 'NEO-HYDELTRASOL'—*each cc. contains 5 mg. (1%) prednisolone 21-phosphate (as sodium salt) and 5 mg. Neomycin Sulfate (equivalent to 3.5 mg. neomycin base); 5-cc. vials.*

MSD

MERCK SHARP & DOHME
DIVISION OF MERCK & CO., INC. PHILADELPHIA 1, PA.

How the ten-day money-back guarantee on every Zenith Hearing Aid

protects both physician and patient

Zenith is proud of its long-held policy which insists that every hard-of-hearing patient has a right to try out a hearing aid thoroughly—under everyday conditions of use—on a Ten-Day Money-Back Guarantee of complete satisfaction. Without this return privilege a disappointed purchaser has no recourse, and the referring physician may be placed in an embarrassing position.

That is why a physician can always refer patients to a Zenith Hearing Aid Dealer with such complete assurance. And of course the famous quality which has made Zenith the world's largest-selling hearing aid offers added protection and peace of mind.

There is a wide range of superb new 4- and 5-transistor Zenith Quality Hearing Aids with modifications to meet every electronically correctable hearing impairment. All models are sensibly priced, ranging from $65 to $165.

You are invited to examine the new Zenith models at your own convenience on Zenith's 30-Day Free Trial Offer for Physicians. No cost or obligation. Just fill in the coupon below to receive details.

Zenith Hearing Aid Dealers are located in principal cities from coast to coast. To contact the one nearest you, see the listing under Hearing Aids in your classified telephone directory. Or mail coupon for list of franchised Zenith Hearing Aid Dealers.

• • •

Free Booklet for Physicians!

Mail the coupon below for a FREE copy of the informative illustrated booklet, "Better Hearing for Your Patient."

ZENITH®

The Royalty of

HEARING AIDS

By the Makers of World-Famous Zenith TV, Radios, and Amazing "Space Command" TV Tuner

Zenith Radio Corporation,
Hearing Aid Division, Dept. 41T
5801 Dickens Ave., Chicago 39, Ill.

Please mail me free booklet, descriptive literature and list of local dealers. Also information on 30-Day Free Trial Offer for Physicians.

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

FOR Rx SUN GLASSES

Tillyer **Cosmetan**

Tillyer **Calobar**

IN THE TILLYER 58 MM SERIES

Now you can satisfy the increasing demand for Quality sun glasses in modern high style frames. 9 out of 10 prescriptions can be taken from Tillyer 58 MM Series. Cosmetan and Calobar are available in a wide range of foci.

American Optical COMPANY

AVOID UNNECESSARY RISKS!

prevent the possibility of secondary pyocyaneous ulcers by using **safe . . .**

the FLUORISTRIP
Fluorescein Sod. USP on special lint free paper, with stain-proof finger grips . . . packaged two in an envelope for bilateral application . . . **REMAINS PERMANENTLY STERILE.**

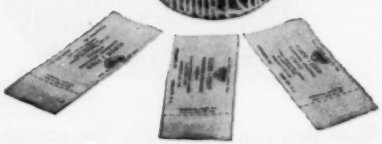
OPHTHALMOS
FLUOR I STRIP

the renowned, single-use, disposable, sterile fluorescein applicator

in boxes of 100 or hospital size packages of 1000 envelopes.

- IN SURGERY
- IN DIAGNOSIS
- IN TREATMENT

for always sterile corneal staining...
clean! convenient! rapid!
completes your sterile technique



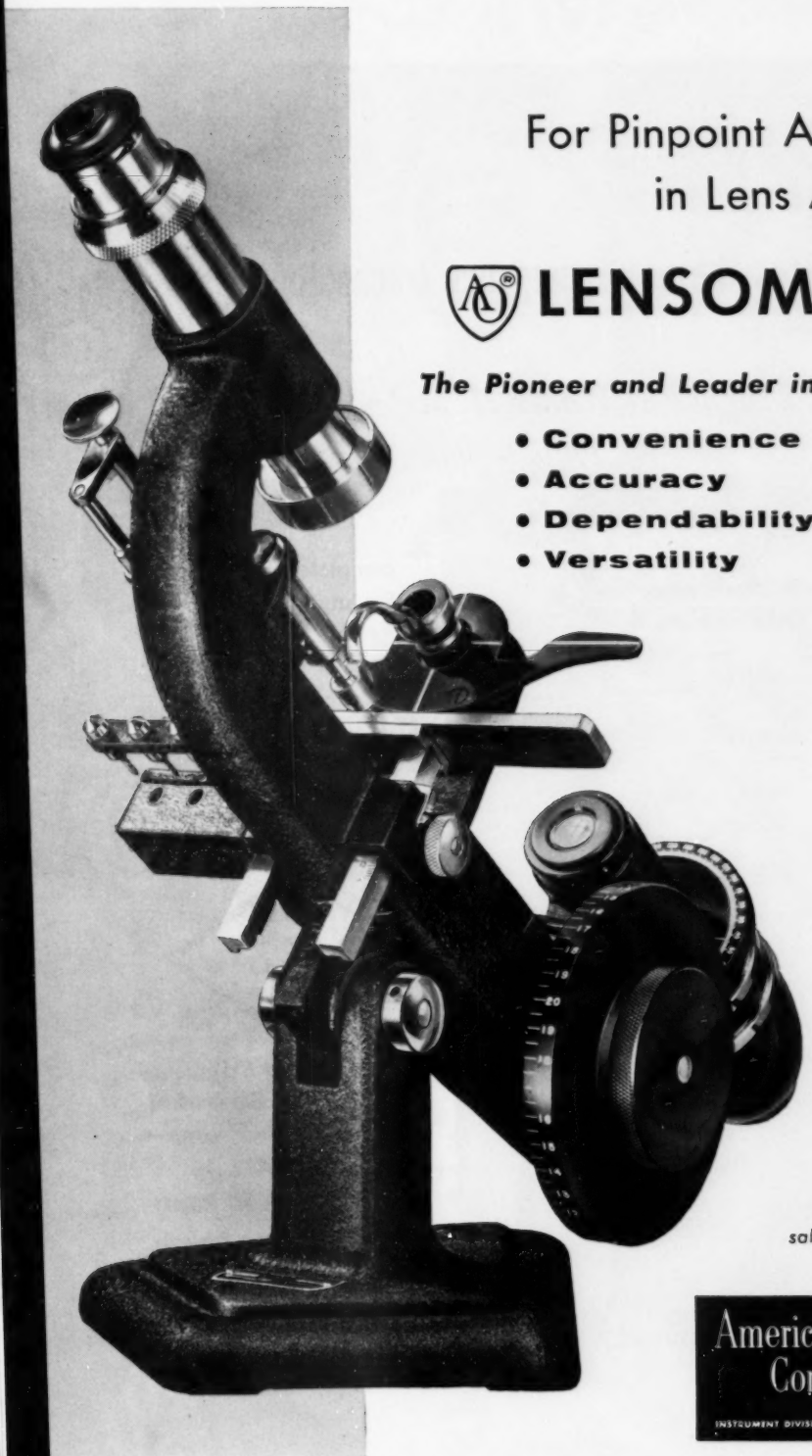
IDEAL FOR FITTING CONTACT LENSES

tested and approved by leading ophthalmic and industrial clinics

For complete details, write to:

OPHTHALMOS, Inc.
Union City, New Jersey

Distributed in: Canada: Professional Sales Corp., Montreal; Puerto Rico & V. I.: Wiewall Drug Corp., Santurce



For Pinpoint Accuracy
in Lens Analysis

LENSOMETER

The Pioneer and Leader in

- **Convenience**
- **Accuracy**
- **Dependability**
- **Versatility**

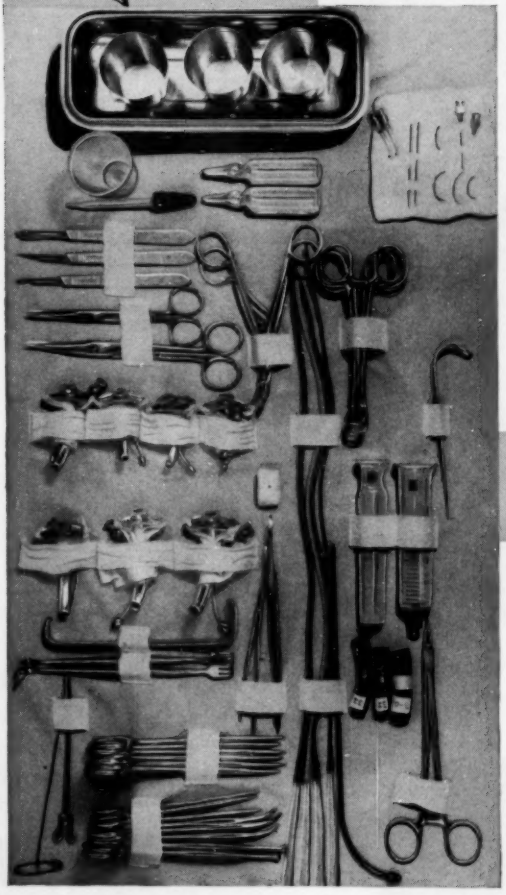
Talk to your sales representative or write

American Optical Company

INSTRUMENT DIVISION, BUFFALO 15, NEW YORK

This is the new emergency tracheotomy set

Designed by Walter H. Maloney, M.D. Philadelphia . . .



* complete in every detail for any emergency

* kept in sterile storage, ready for immediate use with no delay; send for special brochure

the hallmark of quality
PILLING
PHILADELPHIA

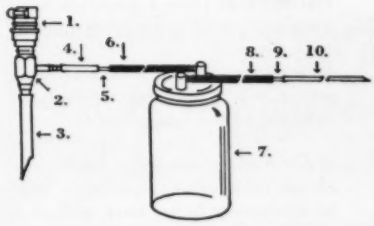
The Maloney Emergency Tracheotomy Set is available only from Pilling—

George P. PILLING & Son Company
3451 Walnut Street Philadelphia

First name in instruments for bronchoesophagology—

HOLINGER "take-home" KIT

for Tracheotomy and Laryngectomy Patients



1. Faucet connection
2. Suction pump
3. Splash hose
4. Rubber connector
5. Glass connector
6. 6′ Rubber tubing
7. Glass jar
8. 6′ Rubber tubing
9. Glass connector
10. Rubber catheter

A handy, compact, and complete kit for home care:

. . . water suction pump
—with adaptor for threaded or plain faucet

. . . safety trap glass jar

. . . aspirating catheters

. . . glass connecting tips and rubber tubing

plus gauze pads, bandage, wire, and worsted cleaners for cleansing tracheotomy tubes

plus leatherette zipper case

Complete Kit $19.00 postpaid—The Holinger "Take-Home" Kit is available only from Pilling—order direct:

GEORGE P. *PILLING* & SON CO.

3451 WALNUT STREET
PHILADELPHIA

HEADQUARTERS FOR INSTRUMENTS FOR BRONCHOESOPHAGOLOGY

unexcelled topical relief for the "burning" eyes of hay fever

NEW METRETON OPHTHALMIC SUSPENSION

METRETON,® brand of corticoid-antihistamine compound.
METICORTELONE,® brand of prednisolone.
CHLOR-TRIMETON,® brand of chlorprophenpyridamine preparations.

Combines clinically established
METICORTELONE—a topical steroid of choice for more effective control of ocular allergy, inflammation, edema.

CHLOR-TRIMETON—a preferred antihistamine, potent and nonirritating.

for maximum relief of itching, burning, tearing, aching, discharge, redness, photophobia, edema, congestion.

in ocular allergies—allergic blepharitis, allergic conjunctivitis, episcleritis, ocular involvement in hay fever, and other eye allergies.

Each cc. of METRETON Ophthalmic Suspension contains 2 mg. (0.2%) prednisolone acetate and 3 mg. (0.3%) chlorprophenpyridamine gluconate. Supplied in 5 cc. dropper bottles.

Schering

MT-J-367

"...no known contraindications."[1]

Many thousands of cases attest

to the efficacy of

adrenosem®

Salicylate*

(Brand of carbazochrome salicylate)

in the control of bleeding

Adrenosem Salicylate has been used prophylactically and therapeutically in virtually every operative procedure. Case histories have been published on its successful use in the following procedures and conditions:

Tonsillectomy, adenoidectomy and nasopharynx surgery
Prostatic, bladder and transurethral surgery
Excessive postpartum bleeding and uterine bleeding
Thoracic surgery
Gastrointestinal bleeding

Also:

Idiopathic purpura
Retinal hemorrhage
Familial telangiectasia
Epistaxis
Hemoptysis
Hematuria
Pulmonary bleeding
Metrorrhagia and menorrhagia

1. Bacala, J.C.: The Use of the Systemic Hemostat, Carbazochrome Salicylate, West. J. Surg. *64*:88 (Jan., 1956)

*U.S. Pat. 2581850; 2506294

THE S. E.
MASSENGILL
COMPANY

Bristol, Tennessee • New York
Kansas City • San Francisco

A short history-in quotes-of

adrenosem®
Salicylate

"... a potent antihemorrhagic factor."

Sherber, D.A.: The Control of Bleeding, Am. J. Surg. *86*:331 (Sept., 1953)

"... since that date (1953) Adrenosem has been used postoperatively to reduce bleeding from all otolaryngologic and bronchoesophagologic procedures..."

Peele, J.C.: Adrenosem in the Control of Hemorrhage from the Nose and Throat, A.M.A. Arch. of Otolaryng. *61*:450 (April, 1955)

"Our experience of the effect of carbazochrome salicylate on 317 surgical indications and 13 obstetrico-gynecological conditions has been therapeutically encouraging and successful for the control of capillary bleeding."

Bacala, J.C.: The Use of the Systemic Hemostat Carbazochrome Salicylate, West. J. Surg. *64*:88 (Jan., 1956)

"We have also noticed that bleeding stopped more promptly on the operating table."

Owings, Capers B.: The Control of Postoperative Bleeding with Adrenosem, Laryngoscope *55*:21 (Jan., 1955)

"*Primary* hemorrhage occurred in 1.7 percent and *secondary* hemorrhage in 1 percent of the 300 control patients, but in *none* of the 500 children who received preoperative and postoperative medication [Adrenosem Salicylate]."

Orzac, E.: Medical Care of the Child Patient Before and After Adenoidectomy and Tonsillectomy, N.Y. State J. Med. *55*:886 (Mar., 1956)

"Adrenosem Salicylate is nontoxic and has a high index of therapeutic safety. At the recommended dosage levels there are no contraindications. It has no cumulative effect. Patients treated for more than two years show no toxic effects attributable to the drug."

Riddle, A.C., Jr.: Adrenosem Salicylate: A Systemic Hemostat, Oral Surg., Oral Med., Oral Path. *6*:617 (June, 1955)

Adrenosem Salicylate is supplied in
- ampuls
- tablets
- and as a syrup.

Write for comprehensive illustrated brochure describing the action and uses of Adrenosem Salicylate.

THE S. E. **MASSENGILL** COMPANY

BRISTOL, TENNESSEE • NEW YORK • KANSAS CITY • SAN FRANCISCO

AFTER YOUR EXAMINATION...

The full benefits of your knowledge, care and professional skill depend to a great degree upon the quality and accuracy of the ophthalmic materials with which your decision—your prescription—is executed.

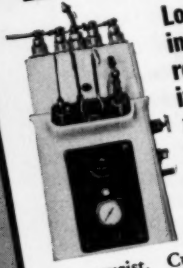
Our understanding of this responsibility is reflected in the preference that has made Shuron the world's largest organization devoted exclusively to serving the ophthalmic profession. You can be sure with Shuron.

SHURON OPTICAL COMPANY, INC. SHURON® **Geneva, N. Y. Rochester, N. Y.**

ONLY RITTER OFFERS YOU A COMPLETE ENT UNIT

Medicament, special spray and suction bottles within easy reach

Swinging instrument table easily positioned where you want it with a touch of the fingers. Stainless steel tray holds sterilized instruments, plus any additional electrical instruments in readiness.



Low voltage instruments ready for instant use

Low voltage instruments positioned for easy grasp, are used without constant cord pull, yet are returned to the unit with a flick of the wrist. Current automatically turned off when instrument returned to holder.

Individual rheostats control cauteries and illuminated instruments. Auxiliary switch can control room lighting or Ritter Compressor. All controls and call button are within easy reach . . . pressure and vacuum gauge visible from operating position. Unit has extra plug-jack on side, for attaching head lamp or other low voltage instruments.

You have *everything* at your fingertips! . . . with a Ritter Ear, Nose and Throat Unit. With this unit equipment necessities for ENT work are carefully placed within your examining and treatment area . . . the cuspidor, conveniently located for patient use . . . the surgical aspirator with interchangeable tip right at hand . . . the low voltage instruments and spray bottles, centrally located for easy grasp . . . a swinging tray, holding medicaments and other instruments, effortlessly positioned to suit your needs.

The Ritter Ear, Nose and Throat unit was designed to help you utilize your skills to the fullest extent with a minimum of effort. You have your choice of four models—the cuspidor on the right or left side as an integral part of the unit, or a right or left-hand unit with the surgical cuspidor separate for placing on the opposite side of the chair.

WRITE for complete, detailed information on the Ritter ENT Unit, Ritter ENT Motor Chair, or Ritter Combination Ear, Nose and Throat-Oral Surgery Unit. Ritter Company Inc., 4830 Ritter Park, Rochester 3, New York.

Ritter Company Inc.

In OPHTHALMIC MEDICATION . . .

A Dynamic Union

POLYMYXIN • HYDROCORTISONE • NEOMYCIN

ISOPTO®

P • H • N

Sterile Ophthalmic Suspension With Methylcellulose

- A synergistic, broad-spectrum, rapidly acting combination of Polymyxin B Sulfate (16,250 units/cc)—Hydrocortisone Acetate (0.5% and 1.5%)—and Neomycin Sulfate (5mg/cc).
- 95.8% effective in 142 cases of allergic, bacterial and traumatic conjunctivitis, meibomianitis and blepharitis.*
- Supplied in two concentrations of Hydrocortisone (0.5% and 1.5%) to provide *economical* choice.
- Methylcellulose vehicle provides 6 to 8 times longer contact with eye than simple aqueous suspensions.
- Packaged in ALCON'S original plastic 5cc DROP-TAINER®.

*WRITE FOR CLINICAL DATA

MANUFACTURED EXCLUSIVELY BY

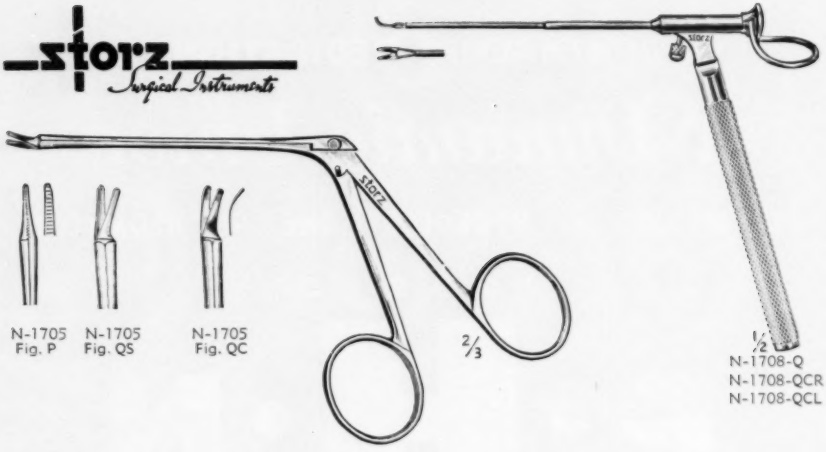
Alcon

LABORATORIES, INC. FORT WORTH, TEXAS

Executive Offices: 1400 Henderson

PHN—1

storz
Surgical Instruments



Instruments for
Stapes Mobilization

•

N-1705* Fig. P Forceps, Alligator, HOUSE.

N-1705* Fig. QS Scissors, Alligator, BELLUCCI: straight.

N-1705* Fig. QC Scissors, Alligator, BELLUCCI: curved.

N-1705* Fig. R Scissors, HOUSE: very narrow, Mayo type.

N-1708* Fig. Q Scissors, Anterior Crurotomy, FOWLER: light curve. Without serration.

N-1708* Fig. QCR Scissors, Anterior Crurotomy, FOWLER: curved, right. For left ear. With serrations.

N-1708* Fig. QCL Scissors, Anterior Crurotomy, FOWLER: curved, left. For right ear. With serrations.

* Designates STAINLESS STEEL.

An illustrated Booklet showing Newly Developed Instruments for

MOBILIZATION OF STAPES OPERATION

by

FOWLER
HOUSE
ROSEN
GOODHILL
KOS
WALSH
. . . and others

sent upon request.

Storz Instrument Company

4570 Audubon Avenue **St. Louis 10, Missouri**

Her Best Friend Can't Tell

Your patients gain confidence in their public life knowing that others won't notice the artificial eye. They avoid feelings of inferiority in their personal life when best friends can't tell the difference.

Let our 105 years' experience help you perfectly match your patients' eyes. Our experienced men visit most areas regularly to fit your patients, custom-make eyes to match, and offer you technical assistance on difficult cases. Call or write our nearest office.

Complete Artificial Eye Service

- Eyes custom made—glass or plastic
- Eyes from stock sent on same day order received—glass or plastic
- Damaged or broken eyes accurately matched
- Fitted to all types of motility implants
- Implants, X-Ray therapy shields, foreign body locators
- Superior Quality—Finest Workmanship

Mager and Gougelman inc.

Serving the Profession Since 1851

30 N. Michigan Ave. Chicago 2, Illinois

120 E. 56th St. New York 22, N. Y.

CLEVELAND DETROIT HOUSTON (Soper Bros.)
KANSAS CITY MINNEAPOLIS ST. LOUIS
BOSTON PHILADELPHIA PITTSBURGH WASHINGTON

URGENT REQUEST

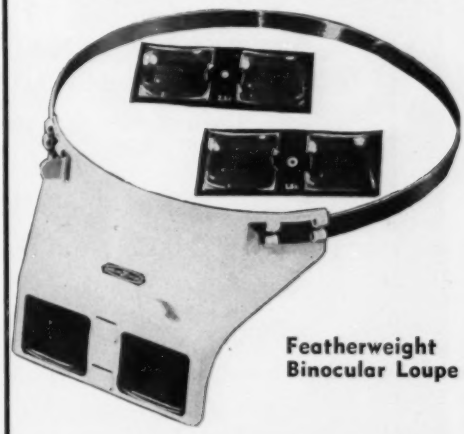
The Uveitis Laboratory, University of California School of Medicine, San Francisco, is interested to obtain freshly enucleated eyes from patients with **all types of uveitis** and other endogenous inflammations. Attempts are being made to isolate etiologic agents from these eyes.

The eyes should **not** be fixed in preservatives or frozen, but placed in a sterile bottle, packaged, and shipped as quickly as possible. Please send specimens air express, special delivery, **collect.** Enclose history and findings, and mark the package "Fresh Tissue Specimen—Rush."

A report of isolations of organisms and pathologic findings, including a slide, will be sent to the contributor. Credit will be given in any resulting publications, if desired.

Telegraph collect if specimen is being sent. Send eyes to . . .

Samuel Kimura, M.D.,
Michael J. Hogan, M.D., or
Phillips Thygeson, M.D.
University of California School of Medicine, San Francisco 22



Featherweight Binocular Loupe

Permits interchange of higher or lower power lens mountings. Designed to give complete comfort when wearing glasses. Can be sterilized without harm. Now available with choice of 1½X, 2X or 2½X. **$12.50** P.P. Additional powers **$5** pr. ppd.

BARNETT Optical Laboratories
3120 North Cicero Ave., CHICAGO 41, ILL.

THE NEW YORK POLYCLINIC
MEDICAL SCHOOL AND HOSPITAL
(ORGANIZED 1881)

(The Pioneer Post-Graduate Medical Institution in America)

EYE, EAR, NOSE AND THROAT

A three months' combined full-time refresher course consisting of attendance at clinics, witnessing operations, lectures, demonstration of cases and cadaver demonstrations; operative eye, ear, nose and throat on the cadaver; clinical and cadaver demonstrations in bronchoscopy, laryngeal surgery and surgery for facial palsy; refraction; radiology; pathology, bacteriology and embryology; physiology; neuro-anatomy; anesthesiology; physical medicine; allergy, as applied to clinical practice. Examination of patients preoperatively and follow-up postoperatively in the wards and clinics. Attendance at departmental and general conferences.

For information about this and other courses address
THE DEAN: 345 West 50th St., NEW YORK 19, N. Y.

Embryology of the Ear

Motion Picture in color with sound, 16 mm. safety film, 3,300 feet, showing time 54 minutes.
Now $500.00

Album of Embryology of the Ear, text and 96 key pictures selected by the McNally Committee for use with the motion picture. $125.00

Motion Picture and Album combined in one order, now $600.00. Partial payments on the purchases of the motion picture and the combined set may be arranged for limited budgets. Each print of the motion picture is made up on special order — new — fresh; delivery requires about three weeks. A few Albums available for immediate delivery.

WILLIAM L. BENEDICT, M.D.
15 Second Street S.W. • Rochester, Minnesota

JUST AS A REMINDER

4 E.N.T. products to remember!

AURALGAN®
EAR DROPS

IN ACUTE OTITIS MEDIA
SAFE AURALGESIC
AND DECONGESTANT

O-TOS-MO-SAN®
BACTERICIDAL – FUNGICIDAL

BROAD-SPECTRUM
THERAPY WITHOUT
ANTIBIOTICS

RHINALGAN®
NASAL SPRAY

SAFE!
"NOT JUST ANOTHER
DECONGESTANT"

LARYLGAN®
THROAT SPRAY • GARGLE • SWAB

FOR INFECTIOUS
AND NON-INFECTIOUS
THROAT INVOLVEMENTS

DOHO CHEMICAL CORP., 100 VARICK ST., NEW YORK 13, N.Y.

MANUALS

	PRICE
RETINAL DETACHMENT, H. Arruga, et al.	$1.00
OCULAR SURGERY, Conrad Berens and Michel Loutfallah	1.00
CATARACT TYPES, F. C. Cordes	1.00
SLIT LAMP BIOMICROSCOPY, E. Goar, et al.	1.00
OUTLINE OF NEURO-OPHTHALMOLOGY, P. J. Leinfelder	1.00
DESCRIPTION OF THE ORBIT, McCotter, Fralick and Henderson	1.00
GLAUCOMA, Samuel J. Meyer	1.00
THE INTERPRETATION OF VISUAL FIELDS, C. W. Rucker	1.00
DISTURBANCES OF OCULAR MOTILITY, Richard G. Scobee	1.00
REFRACTION, Daniel Snydacker and Frank W. Newell	1.00
EXTRINSIC EYE MUSCLES, H. Saul Sugar	1.00
PRINCIPLES OF OTOLARYNGOLOGIC PLASTIC SURGERY, Oscar J. Becker	1.00
RADIOGRAPHIC ANATOMY OF THE TEMPORAL BONE, J. Brown Farrior	1.00
EXAMINATION OF THE LABYRINTH IN RELATION TO ITS PHYSIOLOGY AND NONSUPPURATIVE DISEASES, W. J. McNally and E. A. Stuart	1.00
NONSURGICAL COMPLICATIONS OF OTOLARYNGOLOGIC SURGERY, J. J. Pressman, et al.	1.00

MONOGRAPHS

HELPFUL HINTS FOR HANDLING THE HEARING HANDICAPPED, Gordon D. Hoople, et al.	$0.25
HEARING TESTS, Arthur L. Juers	0.25
PHYSIOLOGY OF THE LARYNX, J. J. Pressman and George Kelemen	.50
THE EMBRYOLOGY OF THE EAR, NOSE, AND THROAT, O. E. Van Alyea	0.25
STRABISMUS: A SYMPOSIUM, Kenneth C. Swan, et al.	0.50
REFRACTION DIFFICULTIES Clarence A. Veasey, Jr.	0.50

ABSTRACTS

Set contains outlines, briefs of instruction courses as presented at Academy meetings. Unbound.

Ophthalmology:	1954	$3.50
	1955	5.00
	1956	7.50
Otolaryngology:	1954	2.00
	1955	2.00
	1956	2.50

TRANSACTIONS

Subscription:	Per year, bimonthly publication	$10.00
Single issue:	Through 1950	0.50
	1951 through 1956	1.00
	1957	2.00

BOUND VOLUMES

Transactions:		
	Records of meetings held 1917 through 1949	Ea. $1.50
	Vol. 55 (1951) through Vol. 60	Ea. 5.00
Tonometry—Tonography, Decennial Report (Bound)		Ea. 3.00

FILMS — LANTERN SLIDES — FILM STRIPS

THE EMBRYOLOGY OF THE EYE, a motion picture in color with sound. Available on one reel or in two parts on two reels with metal containers and mailing case — Per Print	$200.00
176 Lantern Slides from above film, 2 × 2, in color Mounted in glass, with wooden filing box	125.00
Mounted in cardboard, with plastic and plywood filing box	75.00
Film Strips, from above film, 32 mm. Set of six (176 frames), in color, in metal containers	25.00
THE EMBRYOLOGY OF THE EAR, a motion picture in color with sound. On three reels with metal containers and mailing case — Per Print	500.00

SEND ORDER WITH REMITTANCE TO

W. L. BENEDICT, M.D., 15 SECOND STREET S.W., ROCHESTER, MINNESOTA

American Academy of Ophthalmology and Otolaryngology

THE COUNCIL — 1957

Erling W. Hansen, Minneapolis ..... President
LeRoy A. Schall, Boston ..... President-Elect
Louis H. Clerf, St. Petersburg, Florida ..... First Vice-President
David O. Harrington, San Francisco ..... Second Vice-President
O. E. Van Alyea, Chicago ..... Third Vice-President
Walter H. Theobald, Chicago ..... Past President
Algernon B. Reese, New York ..... Past President
A. C. Furstenberg, Ann Arbor, Michigan ..... Past President
William L. Benedict, Rochester, Minn. ... { Executive Secretary-Treasurer; Editor and Business Manager of the TRANSACTIONS
Kenneth L. Roper, Chicago ..... Secretary for Ophthalmology
Eugene L. Derlacki, Chicago ..... Secretary for Otolaryngology
A. D. Ruedemann, Detroit ..... Secretary for Instruction in Ophthalmology
Dean M. Lierle, Iowa City ..... Secretary for Instruction in Otolaryngology and Maxillofacial Surgery
Daniel Snydacker, Chicago ..... Secretary for Home Study Courses
Glen Gibson, Philadelphia ..... Secretary for Public Relations
Sam E. Roberts, Kansas City, Missouri ..... Councillor
Harold H. Joy, Syracuse, New York ..... Councillor
William J. McNally, Montreal, Que., Canada ..... Councillor
Victor A. Byrnes, Washington, D. C. ..... Councillor

COUNCIL COMMITTEES

Executive, Research and Finance

Erling W. Hansen, *Chairman*
Walter H. Theobald — LeRoy A. Schall
Algernon B. Reese — Sam E. Roberts
A. C. Furstenberg — William L. Benedict

Research and Finance

(*Subcommittee of Executive, Research and Finance*)
Walter H. Theobald, *Chairman*
Erling W. Hansen — William L. Benedict

Activities

Sam E. Roberts, *Chairman*
Harold H. Joy — LeRoy A. Schall
William J. McNally — Louis H. Clerf
Victor A. Byrnes

Judicial

Erling W. Hansen, *Chairman*
Sam E. Roberts — William J. McNally
Harold H. Joy — Victor A. Byrnes

Board of Councillors

Sam E. Roberts, *Chairman*
Harold H. Joy — Victor A. Byrnes
William J. McNally

Board of Secretaries

William L. Benedict, *Chairman*
Kenneth L. Roper — Dean M. Lierle
Eugene L. Derlacki — Daniel Snydacker
A. D. Ruedemann — Glen Gibson

Program

Erling W. Hansen, *Chairman*
LeRoy A. Schall — Eugene L. Derlacki
Louis H. Clerf — A. D. Ruedemann
Sam E. Roberts — Dean M. Lierle
William L. Benedict — Daniel Snydacker
Kenneth L. Roper — Glen Gibson

STANDING COMMITTEES

Conservation of Hearing

Executive Committee

Dean M. Lierle, M.D., *Chairman*, Iowa City, Iowa
Lawrence R. Boies, M.D. ..... Minneapolis, Minn.
John E. Bordley, M.D. ..... Baltimore, Md.
Norton Canfield, M.D. ..... New Haven, Conn.
Hallowell Davis, M.D. ..... St. Louis, Mo.
Kenneth M. Day, M.D. ..... Pittsburgh, Pa.
Edmund P. Fowler, Jr., M.D. ..... New York, N. Y.
Meyer S. Fox, M.D. ..... Milwaukee, Wis.
Aram Glorig, Jr., M.D. ..... Los Angeles, Calif.
Victor Goodhill, M.D. ..... Los Angeles, Calif.
Stacy Guild, Ph.D. ..... Baltimore, Md.
Gordon D. Hoople, M.D. ..... Syracuse, N. Y.
Howard P. House, M.D. ..... Los Angeles, Calif.
Raymond E. Jordan, M.D. ..... Pittsburgh, Pa.
Arthur L. Juers, M.D. ..... Louisville, Ky.
Charles E. Kinney, M.D. ..... Cleveland, Ohio
John R. Lindsay, M.D. ..... Chicago, Ill.
H. E. McHugh, M.D. ..... Montreal, Que., Canada
James W. McLaurin, M.D. ..... Baton Rouge, La.
W. J. McNally, M.D. ..... Montreal, Que., Canada
C. Stewart Nash, M.D. ..... Rochester, N. Y.
Harold Schuknecht, M.D. ..... Detroit, Mich.
George E. Shambaugh, Jr., M.D. ..... Chicago, Ill.
K. M. Simonton, M.D. ..... Rochester, Minn.
J. Tonndorf, M.D. ..... Iowa City, Iowa
Henry L. Williams, M.D. ..... Rochester, Minn.

Consultants

Raymond Carhart, Ph.D. ..... Evanston, Ill.
Eva Thompson Carson ..... Glenview, Ill.
Howard A. Carter ..... Chicago, Ill.
Merle Lawrence, Ph.D. ..... Ann Arbor, Mich.
Scott N. Reger, Ph.D. ..... Iowa City, Iowa
Walter A. Rosenblith, Ph.D. ..... Cambridge, Mass.

Committee on Implants and Implant Techniques

A. D. Ruedemann, M.D., *Chairman*, Detroit, Mich.
James H. Allen, M.D. ..... New Orleans, La.
Peter H. Ballen, M.D. ..... Hempstead, L. I., N. Y.
Alson E. Braley, M.D. ..... Iowa City, Iowa
J. Gordon Cole, M.D. ..... New York, N. Y.
Norman L. Cutler, M.D. ..... Wilmington, Del.
Orwyn H. Ellis, M.D. ..... Los Angeles, Calif.
Wendell L. Hughes, M.D. ..... Hempstead, L. I., N. Y.
Lorand V. Johnson, M.D. ..... Cleveland, Ohio
Robert A. Schimek, M.D. ..... Detroit, Mich.
Byron Smith, M.D. ..... New York, N. Y.
William Stone, M.D. ..... Brookline, Mass.
Richard C. Troutman, M.D. ..... New York, N. Y.

Representatives from Eyemakers

Lee Allen ..... Iowa City, Iowa
Roger Alton ..... Southbridge, Mass.
Fritz Jardon ..... Detroit, Mich.
Hugh Laubheimer ..... Chicago, Ill.

Ophthalmic Pathology

Michael J. Hogan, M.D., *Chairman*, San Francisco, Calif.
F. Phinizy Calhoun, Jr., M.D. ..... Atlanta, Ga.
John S. McGavic, M.D. ..... Bryn Mawr, Pa.
Theodore E. Sanders, M.D. ..... St. Louis, Mo.

STANDING COMMITTEES — *Continued*

Otolaryngic Pathology

Paul H. Holinger, M.D., *Chairman*, Chicago, Ill.
David D. DeWeese, M.D. ..... Portland, Ore.
Edmund P. Fowler, Jr., M.D. ..... New York, N. Y.
John R. Lindsay, M.D. ..... Chicago, Ill.
James W. McLaurin, M.D. ..... Baton Rouge, La.
John A. Murtagh, M.D. ..... Hanover, N. H.
George F. Reed, M.D. ..... Boston, Mass.
Ben H. Senturia, M.D. ..... St. Louis, Mo.

Pan-American Relations in Ophthalmology

Conrad Berens, M.D., *Chairman*, New York, N. Y.
James H. Allen, M.D. ..... New Orleans, La.
Moacyr E. Alvaro, M.D. ..... Sao Paulo, Brazil
Victor A. Byrnes, M.D. ..... Washington, D. C.
William B. Clark, M.D. ..... New Orleans, La.
Frederick C. Cordes, M.D. ..... San Francisco, Calif.
Alfred J. Elliot, M.D. ..... Toronto, Ont., Canada
Louis J. Girard, M.D. ..... Oyster Bay, L. I., N. Y.
Erling W. Hansen, M.D. ..... Minneapolis, Minn.
Robison D. Harley, M.D. ..... Atlantic City, N. J.
S. Rodman Irvine, M.D. ..... Beverly Hills, Calif.
Philip M. Lewis, M.D. ..... Memphis, Tenn.
Angus L. MacLean, M.D. ..... Baltimore, Md.
John L. Matthews, M.D., *Secretary*, San Antonio, Texas
Brittain F. Payne, M.D. ..... New York, N. Y.
G. Stuart Ramsey, M.D. ..... Montreal, Que., Canada
Shaler Richardson, M.D. ..... Jacksonville, Fla.
Daniel Snydacker, M.D. ..... Chicago, Ill.
Kenneth C. Swan, M.D. ..... Portland, Ore.
Antonio Torres Estrada, M.D. ..... Mexico, D. F.
Derrick T. Vail, M.D. ..... Chicago, Ill.

Pan-American Relations in Otolaryngology

C. L. Jackson, M.D., *Chairman*, Philadelphia, Pa.
Victor R. Alfaro, M.D. ..... Washington, D. C.
Norton Canfield, M.D. ..... New Haven, Conn.
John Marquis Converse, M.D. ..... New York, N. Y.
Jose Conrad Gros, M.D. ..... Havana, Cuba
Paul H. Holinger, M.D. ..... Chicago, Ill.
Howard P. House, M.D. ..... Los Angeles, Calif.
Carlos Munoz-MacCormick, M.D. ..... Santurce, Puerto Rico
William J. McNally, M.D. ..... Montreal, Que., Canada
LeRoy A. Schall, M.D. ..... Boston, Mass.
Theodore E. Walsh, M.D. ..... St. Louis, Md.

Plastic and Reconstructive Surgery

John Marquis Converse, M.D., *Chairman*, New York, N. Y.
Wendell L. Hughes, M.D., *Co-Chairman*, New York, N. Y.
Crowell Beard, M.D. ..... San Jose, Calif.
William C. Huffman, M.D. ..... Iowa City, Iowa
Dean M. Lierle, M. D. ..... Iowa City, Iowa
Merrill J. Reeh, M.D. ..... Portland, Ore.
Byron Smith, M.D. ..... New York, N. Y.
Edmund B. Spaeth, M.D. ..... Philadelphia, Pa.
A. D. Ruedemann, M.D. ..... Detroit, Mich.

Scientific Exhibit

Kenneth L. Roper, M.D., *Chairman* ..... Chicago, Ill.
Eugene L. Derlacki, M.D., *Co-Chairman*, Chicago, Ill.

Standardization of Tonometers

Peter C. Kronfeld, M.D., *Chairman* ..... Chicago, Ill.
Moacyr E. Alvaro, M.D. ..... Sao Paulo, Brazil
E. J. Ballintine, M.D. ..... Cleveland, Ohio
Bernard Becker, M.D. ..... St. Louis, Mo.
Conrad Berens, M.D. ..... New York, N. Y.
W. Morton Grant, M.D. ..... Boston, Mass.
D. O. Harrington, M.D. ..... San Francisco, Calif.
Thomas H. Hodgson, M.D., Toronto, Ont., Canada
John C. McCulloch, M.D. ..... Toronto, Ont., Canada
Earle H. McBain, M.D. ..... San Rafael, Calif.
John M. McLean, M.D. ..... New York, N. Y.
Adolph Posner, M.D. ..... New York, N. Y.
Robert N. Shaffer, M.D. ..... San Francisco, Calif.

Audio-Visual Education

Dean M. Lierle, M.D., *Chairman*, Iowa City, Iowa
W. L. Benedict, M.D., *ex officio*, Rochester, Minn.
Eugene L. Derlacki, M.D. ..... Chicago, Ill.
Kenneth L. Roper, M.D. ..... Chicago, Ill.
A. D. Ruedemann, M.D. ..... Detroit, Mich.

Teachers' Section

Otolaryngology

Gordon D. Hoople, M.D., *Chairman*, Syracuse, N. Y.
John E. Bordley, M.D. ..... Baltimore, Md.
Lester A. Brown, M.D. ..... Atlanta, Ga.
David D. DeWeese, M.D. ..... Portland, Ore.
James W. McLaurin, M.D. ..... Baton Rouge, La.
Joel J. Pressman, M.D. ..... Los Angeles, Calif.
G. O'Neil Proud, M.D. ..... Kansas City, Kan.
George E. Shambaugh, M.D. ..... Chicago, Ill.

Ophthalmology

A. D. Ruedemann, M.D. ..... Detroit, Mich.
Frederick C. Cordes, M.D. ..... San Francisco, Calif.
John H. Dunnington, M.D. ..... New York, N. Y.
Edwin B. Dunphy, M.D. ..... Boston, Mass.
Lawrence T. Post, M.D. ..... St. Louis, Mo.
Edmund B. Spaeth, M.D. ..... Philadelphia, Pa.
Kenneth C. Swan, M.D. ..... Portland, Ore.
Derrick T. Vail, M.D. ..... Chicago, Ill.

Representatives of the Academy to:

American Association for the Advancement of Science

M. Elliott Randolph, M.D. ..... Baltimore, Md.

American Board of Ophthalmology

Kenneth C. Swan, M.D. ..... Portland, Ore.
F. Bruce Fralick, M.D. ..... Ann Arbor, Mich.
Gordon M. Bruce, M.D. ..... New York, N. Y.
Alson E. Braley, M.D. ..... Iowa City, Iowa

American Board of Otolaryngology

Francis E. LeJeune, M.D. ..... New Orleans, La.
George F. Reed, M.D. ..... Boston, Mass.

American College of Surgeons Board of Governors

Shirley Harold Baron, M.D. ..... San Francisco, Calif.
Francis H. Adler, M.D. ..... Philadelphia, Pa.
Harry P. Schenck, M.D. ..... Philadelphia, Pa.

American Committee on Optics and Visual Physiology

Kenneth C. Swan, M.D. ..... Portland, Ore.
Frederick C. Cordes, M.D. ..... San Francisco, Calif.
James E. Lebensohn, M.D. ..... Chicago, Ill.

American Orthoptic Council

John W. Henderson, M.D. ..... Ann Arbor, Mich.
Frank D. Costenbader, M.D. ..... Washington, D. C.
Philip Knapp, M.D. ..... New York, N. Y.

American Standards Association Committee for Standardization of Ophthalmic Lenses

Carl J. Rudolph, M.D. ..... South Bend, Ind.
Arthur C. Linksz, M.D. ..... New York, N. Y.

Alternates

Conrad Berens, M.D. ..... New York, N. Y.
Frank W. Newell, M.D. ..... Chicago, Ill.

American Standards Association Acoustical Standards Board

Gordon D. Hoople, M.D. ..... Syracuse, N. Y.

Joint Committee on Eye Banks

Alson Braley, M.D. ..... Iowa City, Iowa
John Harry King, Jr., M.D. ..... Washington, D. C.

National Committee on Research in Ophthalmology and Blindness

Bernard Becker, M.D. ..... St. Louis, Mo.
A. Edward Maumenee, M.D. ..... Baltimore, Md.

National Society for Crippled Children and Adults, Inc.

Dean M. Lierle, M.D. ..... Iowa City, Iowa

THE TREATMENT OF EXTERNAL OTITIS:

THE DERMATOLOGIST'S VIEWPOINT

ELDON T. PERRY, M.D., MED. SC. D.
PHILADELPHIA, PENNSYLVANIA

WHAT IS EXTERNAL OTITIS?

PAPER after paper has been written deploring the capriciousness of external otitis. Its variable clinical picture, its erratic course and unpredictable prognosis, and its inconstant response to therapy are well know to every clinician who has attempted to deal with this disorder. After successfully treating one patient with external otitis, a physician may find that he is powerless to cope with the external otitis of a second patient. It may seem as if these two patients with the same diagnosis were suffering from two entirely different disorders. As a matter of fact, they probably are.

McLaurin astutely observed that the chief reason for the confusion surrounding external otitis is the conscious or unconscious attempt to gather all of its manifestations under the "same pathological umbrella."[2] He further stated that external otitis is a general name for a number of different diseases whose chief point of resemblance is that they are located in the external auditory canal.

There has never been an attempt to restrict the term "external otitis" to any particular clinical or histopathologic entity. Clinically, the term is applied indiscriminately to any dermatitis of the auditory canal.

From the Department of Dermatology (Donald M. Pillsbury, Director) University of Pennsylvania School of Medicine.

Presented at the Sixty-First Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 14-19, 1956, Chicago.

In 1952, Senturia and Marcus published an etiologic classification of diseases involving the external ear,[3] yet many writers still refer to external otitis as a single disease and persist in the search for one therapeutic agent that will be successful in the treatment of all cases.

Many dermatoses that characteristically localize in other regions may also be found in the ear canal. In some patients, they may be found there exclusively. There is no more reason to try to weld all of these diverse dermatoses into one diagnosis than there is to assume that they will all respond to a common therapeutic agent or regimen.

It is not possible, at our present level of knowledge, to outline a specific and uniformly successful therapeutic program for each entity known to involve the ear canal. We should, nonetheless, try to make a specific diagnosis in each case, because this is the only logical point of departure for a reasonable therapeutic plan.

MAKING A SPECIFIC DIAGNOSIS

How does one go about establishing a specific diagnosis? The first step is a careful evaluation of the clinical picture presented by the involved ear. The general nature of the pathologic process must be determined. Erythema, edema, and exudation connote an acute inflammation. A dry, scaly, or thickened skin indicates chronicity. If there are primary lesions such as papules, vesicles or pustules, or if there are secondary changes

such as scratch marks, crusting or atrophy, they must be recognized. Only by translating the total clinical picture into the words that describe its component parts can one hope to build an unshakable foundation for an etiologic diagnosis. On occasion, the recognition of specific lesions will permit an immediate, conclusive diagnosis.

In most instances, the physician is compelled to broaden the scope of his investigation to include the entire integument and the middle ear. Not infrequently, the recognition of a pathognomonic lesion on the skin of another region of the body immediately reveals the true nature of an otherwise puzzling dermatosis of the ear canal. The discovery of a draining middle ear infection may contribute significantly to a definitive diagnosis of an "idiopathic" external otitis. Rarely, a pruritic external auditory canal may be the initial manifestation of a systemic disease such as lymphoblastoma or urticaria.

Bacterial smears and cultures, fungus scrapings and cultures, or a biopsy of the skin of the canal wall may be indicated in the diagnostic work-up of the patient with external otitis.

One is not justified in relegating his case to the unsatisfactory classification "idiopathic external otitis" until he has bent every effort toward the establishment of a specific etiologic diagnosis.

SPECIFIC OTITIDES AND THEIR MANAGEMENT

Our remarks so far have been couched in the most general terms. Now we are ready to consider some of the specific dermatoses that may involve the human ear canal.

Neurodermatitis may occur as a localized (lichen simplex chronicus) or as a generalized (atopic eczema) dermatitis. In either case, the skin of the external auditory canal may be involved. Pruritus, excoriations (scratch marks) and lichenification (thickening of the skin) are the hallmarks of neurodermatitis. The itching has been attributed to psychologic and allergic mechanisms. The excoriations and lichenification are a direct result of the trauma of scratching. A vicious cycle is set up, because the more the skin itches, the more the patient scratches; and, oddly enough, the more he scratches his skin, the more it itches. If this cycle can be interrupted, the trauma will cease and the skin will heal. The pruritus may be intense, and to rely solely on the patient's desire to abstain from scratching is to invite therapeutic failure. Although any of a number of antipruritics may be used, the local application of hydrocortisone has proved to be especially effective in the treatment of the itching of neurodermatitis. For the canal, suspensions of hydrocortisone are to be preferred over ointments.[1] It is often necessary to support the patient with reassurance and with frequent reminders to avoid scratching because some patients continue to scratch from habit even though the itching is no longer present.

Seborrheic dermatitis characteristically involves the scalp and retroauricular folds. It may also be seen in the eyebrows, at the corners of the nose and mouth, in the axillas, on the midchest, and in the groins. Any or all of these areas may be affected in the patient with seborrheic otitis. The involved regions are usually quite oily and have a greasy, branny scale. In the ear canal, the overall picture may be acute or chronic, or anywhere between the two. Although newer preparations containing selenium are usually chosen for the treatment of seborrheic dermatitis of the scalp, sulfur and resorcin continue to be the treatments of choice for the ear canal. Once again, lotions or other solutions are to be preferred over ointments, which may

not reach the proximal portions of the canal or which may fill the canal and impede drainage. Sulfur and resorcin may be employed in concentrations of 1 to 5 per cent.

Bacterial infections such as furunculosis and cellulitis present clinical pictures so familiar to all who treat the external ear that no descriptions are necessary. In like manner, their response to local and systemic therapy with antibiotics is an accepted fact. Secondary bacterial infection may complicate any of the other dermatoses occurring in the ear canal. In such instances, antibiotic therapy is indicated, but its use should be restricted to the length of time necessary to control the secondary infection. The choice of an antibiotic for local use is an important one. It should be governed not only by the antibacterial spectrum of the medicament and by the vulnerability of the causative organism, but also by the index of skin sensitization of the antibiotic. For example, penicillin and the sulfonamides are poor choices for local application because they may ultimately produce an allergic sensitization of the skin in a relatively high percentage of patients. Coincidentally, ointments containing local anesthetics or antihistamines should not be applied topically because of a similar proclivity to the production of allergic sensitization of the skin.

Infectious eczematoid dermatitis of the ear canal is usually a complication of a draining otitis media. Since the incidence of middle ear infection is higher in children, infectious eczematoid dermatitis is more often seen in this age group. Persistent purulent drainage irritates the skin of the canal, of the pinna, and, sometimes, of the periauricular area. This results in eczematization; the clinical picture consists of erythema, edema and pustules. Mild, soothing local therapy with wet compresses of Burow's solution (1:20) and with calamine lotion will permit the skin to heal if adequate measures are taken to combat the middle ear infection.

Contact dermatitis occurs more frequently in the external auditory canal than most physicians realize. It may present an acute dermatitis with vesicles and weeping, or, at the other extreme, there may be only a persistent pruritus, with or without erythema.[4] The intensity of the clinical picture, indeed the very possibility of a dermatitis developing, depends on three factors: (1) the "skin-sensitizing potential" of the contactant, (2) the threshold of reactivity of the patient's skin, and (3) the duration of exposure. In contact dermatitis the causal allergens are usually simple chemicals, in contradistinction to other allergic states in which the offenders are more apt to be protein in nature. Soap, nail polish, matches and hair lacquer are good examples of possible allergens. As previously mentioned, some topical medicaments (e.g., ointments containing penicillin, sulfonamide, a local anesthetic or an antihistamine) have a high "index of skin sensitization." The list of possible contactants in any individual case may be long and may be entirely different from the possibilities encountered in a second patient with a contact dermatitis of the ear canal.

Patch tests are used to confirm the role of suspected allergens, but their proper application and correct interpretation may present innumerable difficulties. A certain amount of information may be gained by observing the clinical effect of the removal of questionable substances from the patient's environment. He may then be re-exposed to the materials if a corroborative test is desired.

After the diagnosis has been established, the treatment consists of (1) permanent removal of the allergen from the patient's environment, and (2) soothing local therapy. Once again, the anti-

phlogistic properties of local hydrocortisone may be employed to promote healing.

Psoriasis of the ear canal may not feature the many-layered, silvery scale and the dully erythematous plaques that are usually seen when it occurs on more commonly favored sites. In the ear canal, it is often a nondescript dermatitis. However, the discovery of typical lesions of psoriasis on the elbows, knees and scalp or over the sacrum, or of a pitting, friable dystrophy of the nails, may permit a definitive diagnosis of an otherwise nonspecific concomitant external otitis. The treatment of psoriasis of the ear canal, as elsewhere, is sometimes a real challenge, and recurrences are not unusual. Although roentgen therapy may be beneficial, the recurrence of symptoms and the tendency of these patients to go from physician to physician place definite restrictions on its use. Local therapy with tar, chrysarobin or ammoniated mercury is usually helpful.

Chronic discoid lupus erythematosus may be seen over the bridge of the nose and on the cheeks in a butterfly distribution, on the scalp, on the mucous membranes of the mouth, or on the pinna. From the concha it may extend to involve the external auditory canal. The lesions are brightly erythematous with an adherent scale, and the follicular openings are usually dilated and filled with keratinous plugs. If the lesions have been present for a sufficient length of time, atrophy, depigmentation and telangiectasia may be seen. The recognition of chronic discoid lupus erythematosus affords an excellent opportunity for a therapeutic triumph. The fairly recent, empirical use of the newer antimalarial drugs such as chloroquine has revolutionized the treatment of this disease. Chloroquine is administered in doses of 250 mg. two or three times a day. In addition, the patient should be instructed not to expose his skin to sunlight. He should be provided with an adequate sun-screening ointment for use whenever there is any possibility of such exposure.

SUMMARY

"External otitis" is a generic term indicating a dermatitis of the external auditory canal. It means nothing in terms of etiology, clinical or histopathologic picture, or prognosis. Consequently, without modification it cannot serve as a basis for the formulation of a therapeutic program.

Suggestions have been made for the diagnostic study of the individual patient with external otitis.

Examples of some of the diverse dermatoses occurring in the ear canal have been presented, and their clinical characteristics and therapeutic indications have been discussed.

REFERENCES

1. Baer, Rudolf L., and Litt, Jerome Z.: Treatment of otitis externa with hydrocortisone suspension, J.A.M.A., 155:973-974 (July 10) 1954.
2. McLaurin, James W.: Principles of therapy in otitis externa, Laryngoscope, 61: 66-87 (Jan.) 1951.
3. Senturia, Ben H., and Marcus, Morris D.: Etiologic classification of diseases involving the external ear, Ann. Otol., Rhin. & Laryng., 61:18-32 (March) 1952.
4. Shelley, Walter B., and Perry, Eldon T.: The experimental production of external otitis in man, J. Invest. Dermat., in press.

WHAT'S NEW IN THE TREATMENT OF OTITIS EXTERNA: THE OTOLOGIST'S VIEWPOINT

BEN H. SENTURIA, M.D.
ST. LOUIS, MISSOURI

THERAPY of the external ear has swung like a pendulum during the recent history of otology. It was not until the middle of the nineteenth century that the medical profession became gradually aware of the fact that microorganisms might cause aural disease. Initially fungi were recovered; therefore treatment was directed toward their eradication. The work of Pasteur and his contemporaries in the field of microbiology, however, overshadowed mycology for the remainder of that period, and bacterial therapeusis was emphasized.

In the first part of the twentieth century, interest in mycology was rekindled by Sabouraud,[17] and by Castellani and Chalmers.[6] The aroused interest in the study of fungi gained impetus, especially in this country, and our immediate forebearers talked and wrote extensively about the nature of otomycosis. Thus, during our lectures on the treatment of the external ear, we were given little more than an intensive course on the eradication of fungi.

Fortunately, during and after World War II many of our generation of otologists were exposed to a wider spectrum of ear diseases and were forced to learn to treat a variety of dermatoses which involved the ear canal. As one might expect, there followed the present period of skepticism regarding even the existence of such a condition as otomycosis. Therefore, in our treatment of ear diseases we have been pouring into the ear canal every variety of antibacterial and anti-inflammatory agents. As a consequence of this bactericidal mania, lo and behold, we have produced for ourselves a vast number of cases of otomycosis. Another swing of the pendulum has been completed before our eyes, and we in this generation may truly claim that we have done it with our own hands.

Although we have been aware of the problem of external otitis for over a hundred years, little basic information has been acquired regarding the factors which contribute to the development of infections of the skin of the external ear. Until the advent of the antibiotics, physicians were very hesitant to obtain skin from this region for biopsy and the disease had not yet been produced under controlled conditions in an experimental animal. Therefore the associated pathologic changes were not very well understood.

It became clear that we would not understand proper therapy of the various forms of external otitis until we had gained some knowledge of the basic histology, chemistry and bacteriology of the normal skin and of the chemical, pathological and bacterial changes of the diseased skin.

From the Department of Otolaryngology, Washington University School of Medicine, St. Louis.

Much of the research reported herein was performed under grant from the Air Force (Contract AF 33 [038] —28643); from the St. Louis Otological Foundation, St. Louis, and from the Upjohn Co., Kalamazoo, Michigan.

Appreciation is expressed to Charles Carr, Mrs. F. H. Baumann, Dorothy Baldwin and Nancy Hellman for technical assistance. Photomicrographs were prepared by Kramer Lewis.

Presented at the Sixty-First Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 14-19, 1956, Chicago.

MONTHLY INCIDENCE OF EXTERNAL OTITIS AT RANDOLPH FIELD, TEXAS (1944) IN RELATION TO MEAN TEMPERATURE AND HUMIDITY

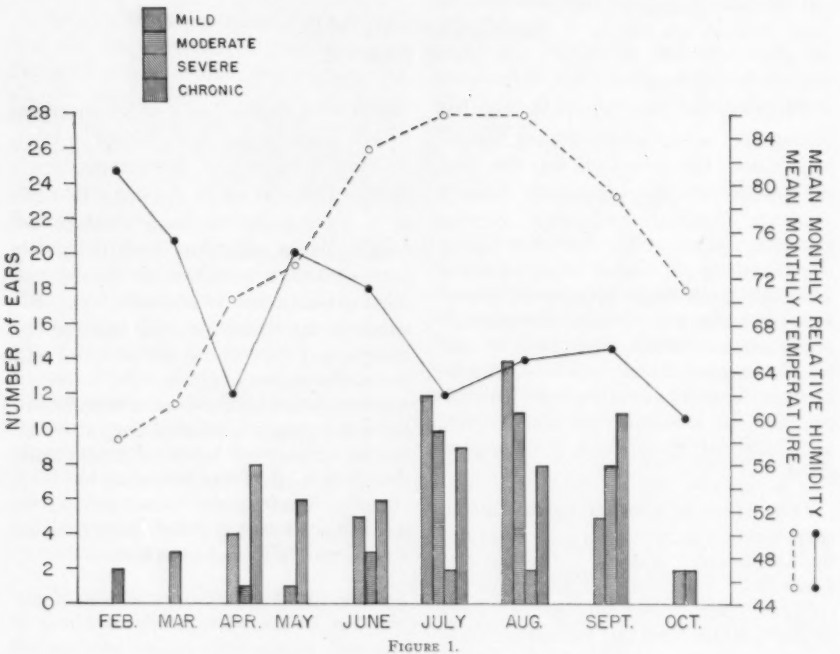


FIGURE 1.

Important progress was made in a series of studies of the histology and physiology of the apocrine (ceruminous) glands of the skin of the axilla and ear canal by Lobitz and Campbell,[11] Montagna,[13] and Shelley and his associates,[9,10,24,25] and later of the skin of the external auditory canal by Perry and Shelley and their co-workers.[14,15,26] These investigations showed fairly conclusively that human apocrine glands are innervated by the autonomic nervous system and that the fibers are adrenergic. Therefore, the delivery of apocrine sweat onto the surface of the skin may be stimulated by such factors as sympathomimetic drugs and emotional stimuli,[29] but it does not occur on exposure to high temperatures.

Many observers have reflected on the possible relationship of swimming, infection, high temperature and the absence of cerumen to the development of ear infections.[4,16] It is our impression[22] that these and other factors play a role in the production of diseases of the external ear. They may be listed as follows:

1. High temperature
2. High humidity
3. Contamination (with bacteria or fungi)
4. Trauma
5. Maceration
6. Lipid removal
7. Stress (anxiety)

No clear evidence exists as to the relative importance of these various factors.

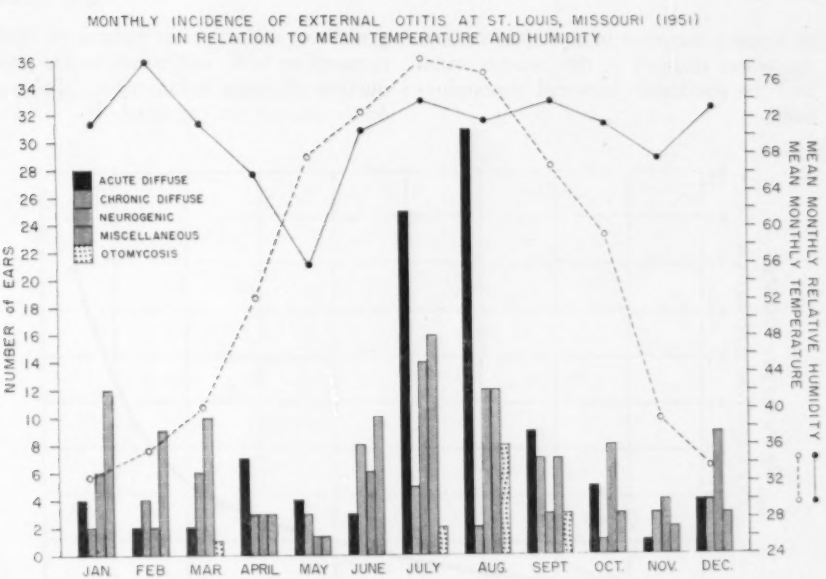

MONTHLY INCIDENCE OF EXTERNAL OTITIS AT ST. LOUIS, MISSOURI (1951)
IN RELATION TO MEAN TEMPERATURE AND HUMIDITY
NUMBER of EARS
ACUTE DIFFUSE
CHRONIC DIFFUSE
NEUROGENIC
MISCELLANEOUS
OTOMYCOSIS
MEAN MONTHLY TEMPERATURE
MEAN MONTHLY RELATIVE HUMIDITY
JAN. FEB MAR APRIL MAY JUNE JULY AUG. SEPT OCT. NOV. DEC.

FIGURE 2.

It therefore appeared desirable to review the available information in the literature and to study them under clinical and laboratory conditions.

There are many references throughout the otologic literature which suggest that high temperature and high humidity are important factors conducive to the development of external ear disease.[4,7,8,18,23] The incidence of external otitis at Randolph Field, Texas, in each month from February through October 1944 has been correlated with the average temperature and humidity for the respective month (fig. 1). A similar study over a period of one year was made at St. Louis, Missouri (fig. 2). In the first instance, a distribution of the cases was made according to the following categories: mild, moderate, severe, and chronic. In the second instance, the categories of external otitis included acute diffuse, chronic diffuse, and neurogenic otitis, otomycosis, and miscellaneous.

It would appear from these data that when the temperature becomes elevated in an environment in which a high relative humidity persists, a rapid increase in the incidence of external otitis occurs. In this area, Mole[12] and Blank[2,3] have made significant contributions. Blank ably demonstrated and emphasized the manner in which the stratum corneum absorbs water from a high-humidity environment (fig. 3), a phenomenon which we feel is important in establishing a state of susceptibility to infection, or what we have chosen to call the preinflammatory state[19] of diffuse external otitis or otomycosis.

It is our impression that lipid removal during swimming and bathing, or by repeated cleansing, provides a means of rapidly increasing the water content of the cornified epithelium. Maceration occurs following the continued contact of the skin of the ear canal with water as a result of diving or underwater swimming. This sets the stage for the hazard

of trauma incurred in trying to remove the water trapped in the osseous canal and the inevitable bacterial contamination.

genic" organisms, after trauma or lipid removal or both, will result in the production of acute inflammatory diseases of the skin of the ear canal.[5,22]

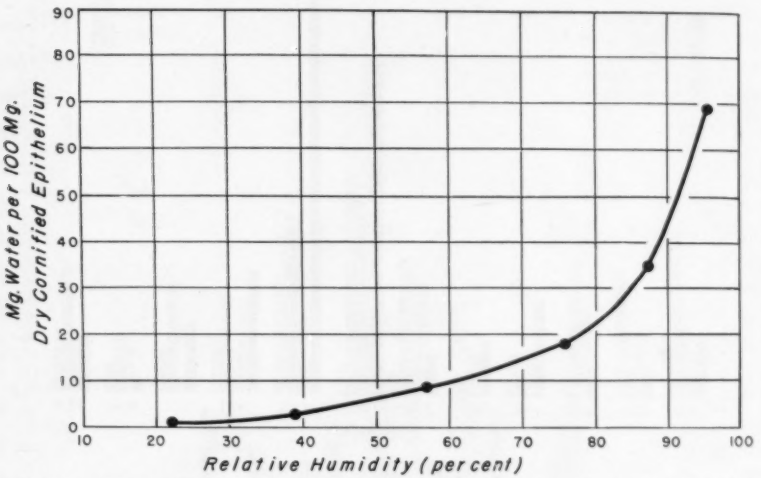


FIG. 3.—Relationship between the water content of cornified epithelium and the relative humidity of the environment at 23° C. (From Blank.[2])

The role of stress in the production of certain forms of external otitis is difficult to assess. There are only a few who would question the importance of anxiety in the so-called neurogenic categories. On the other hand, many of us doubt that stress contributes very much to the production of diffuse external otitis.

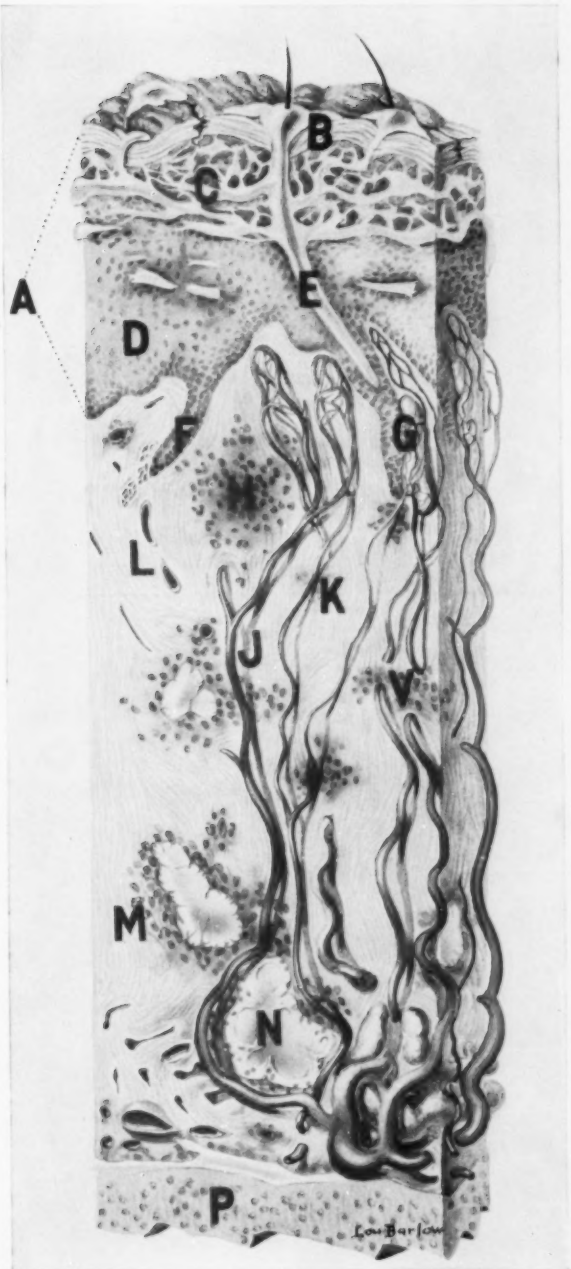
The exact importance of trauma is yet to be evaluated. We feel certain that trauma to the skin of the meatus without instillation of "pathogenic" bacteria will not produce disease even under conditions of high temperature and high relative humidity.[5,22] This is fortunate for those of our colleagues without otologic training who attempt to curet impacted cerumen from the ear canal.

On the other hand, convincing evidence has been accumulated that contamination of the meatus with "patho-

Two experiments, using cats, were set up to evaluate the influence of trauma (T), contamination (I), and lipid removal (L) on the production of external otitis in high and moderate temperatures and relative humidity. The bacteriologic, morphologic, and pathologic changes are diagrammed in figures 4 and 5. It can be seen that no single factor produced consistent morphologic and pathologic inflammatory changes. However, when contamination with Pseudomonas organisms was combined with trauma and/or lipid removal, crusting, redness, exudate, and marked tissue changes were observed.

The changes in the epidermis produced in these experimental animals consisted of hyperkeratosis, some parakeratosis, acanthosis, intercellular and intracellular edema, and a collection of keratinized material in the apopiloseba-

PLATE A



CODED
REPRESENTATION
OF PLATE A

Figurative reconstruction of serial sections obtained for biopsy from the external auditory canals of patients with acute diffuse external otitis. A—Epidermis. B—Hyperkeratosis. C—Fluid accumulation in stratum corneum. D—Acanthosis. E—Apopilosebaceous unit. F—Elongated rete pegs. G—Sebaceous gland. H — Miliary abscess. J — Veins. K—Arteries. L—Apocrine duct (cut in section). M—Periacinar infiltrate. N—Apocrine acini. P—Cartilage. V — Perivascular infiltrate. (Sophian and Senturia.)

PLATE B

CODED REPRESENTATION OF PLATE B

Figurative reconstruction of serial sections of normal human skin from the external auditory canal. A—Epidermis. B—Rete peg. C—Apopilosebaceous unit. D—Sebaceous gland. E—Duct of apocrine gland. G—Apocrine acini. H—Veins. J—Arteries. K—Cartilage. (Sophian and Senturia.)

EXPERIMENT TWO — COOL ROOM (Group B)
Temp. 73–87° — Rel Humidity 68–80%

Cat and Ear	Factor	Morphologic & Bacteriologic Findings										Pathologic Findings (7th Day)
		Day 0	Day 4		Day 7		Day 11		Day 19		
		Bact	Morph	Bact	Morph	Bact	Morph	Bact	Morph	Bact	
53 R	I	Neg.	C+++ R+ X+	Ps.	C+ R+	Ps.	C+++ R+ X+	Ps.	C+	M. albus	
53 L	LT	Neg.	C± X+	Ps.	C±	Neg.	C+	M. albus	C±	M. albus	
54 R	T	Neg.	R±	M. albus	C±	M. albus	C±	Neg.	C+	M. albus	
54 L	LI	M. aureus	C++++ R++++ X+	Ps.	C++ R++ X++	Ps.	C++ R++ X+	Ps.	C+	Ps. M. albus	
55 R	TI	M. aureus	C+++ R+++	Ps.	Abscess C++ R++	Ps.	C+++ X++	Ps.	C+	M. albus	
55 L	L	M. aureus		M. albus		Ps.	C++	Ps. M. albus	C+	M. albus	
56 R	L T I	M. albus	C++++ R++++ X++++	Ps.	C++++ R+++ X+++	Ps.	C+++ R++	Ps.	Expired C±	M. albus	
56 L	Control	M. aureus		M. albus		Neg.		M. albus		M. albus	

Cartilage Epidermis Crusting (Micro) ● Lymphocyte
C = Crusting (Macro) R = Redness X = Exudate ○ Polymorphonuclear neutrophile

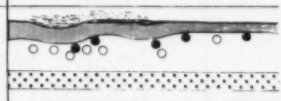
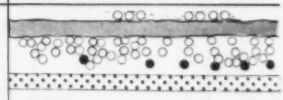
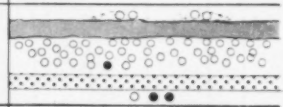
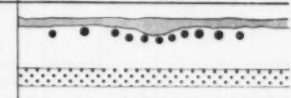
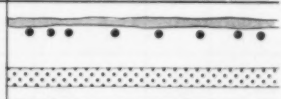
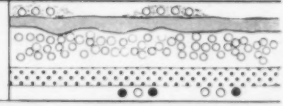
FIG. 4—Evaluation of the influence of trauma (T), contamination (I), and lipid removal (L) on morphologic, bacteriologic, and pathologic changes in the cat ear when the temperature and the relative humidity are moderate. (Senturia and Liebmann.)

ceous orifices (figs. 6 and 7). Alterations in the dermis included edema, a focal to a more diffuse cellular infiltrate, and some dilatation, degeneration, and necrosis of the apocrine glands (figs. 8 and 9).

In most instances the inflammation stopped short of the perichondrial tissues, but in a number of cases the inflammatory changes were found extending through the natural fissures in the cartilages and were present on the deep side of the cartilage (figs. 10 and 11).

It will be seen from these findings[22] that in the cat, it was possible to produce fairly consistently an infection of the external ear with morphologic findings and pathologic changes similar to those reported in biopsies of human tissue.[27] In order to demonstrate the sim-

EXPERIMENT FIVE – HOT ROOM (Group A)
Temp. 80°-90° – Rel. Humidity 84-100%

Cat and Ear	Factor	Morphologic & Bacteriologic Findings: Day 0 Bact.	Day 2 Morph.	Day 3 Morph.	Day 3 Bact.	Pathologic Findings (3rd Day)
69 R	TI	M. albus	C ±	C ± R++ X+	Ps.	
69 L	LI	Neg.	C ±	C+ R++ X+	Ps.	
70 R	L T I	M. albus	C+	C+ R+	Ps.	
70 L	Control	M. albus	C+		M. albus	
71 R	Control	M. albus	C++	C ±	M. albus	
71 L	TI	M. albus	C+++	C+ R+	Ps.	

Cartilage Epidermis Crusting (Micro) Lymphocyte
C = Crusting (Macro) R = Redness X = Exudate O Polymorphonuclear neutrophile

FIG. 5—Evaluation of the influence of trauma (T), contamination (I), and lipid removal (L) on morphologic, bacteriologic, and pathologic changes in the cat ear when the temperature and relative humidity are high. (Senturia and Liebmann.)

ilarity of the pathologic findings, I should like to recall to you briefly the nature of the inflammatory changes which we observed in the examination of human tissue.

In all the skin sections examined, striking changes were seen (Color Plates A and B). The total thickness of the epidermis was often greatly increased by cellular proliferation and edema. The surface layer showed considerable thickening, with irregularly arranged masses of keratinized cells, many of which retained their nuclei. Hyperplasia of the prickle cell and basal cell layers often progressed to a striking degree. The cells were increased in number as well as size, and intercellular and intracellular edema was prominent. The rete pegs were elongated and broadened. The dermatoepidermal margin was frequently ill defined. Neutrophils could be found infiltrating all the layers of the epidermis, and occasionally a microabscess was found.

The inflammatory phenomena were greatest in and around the capillary

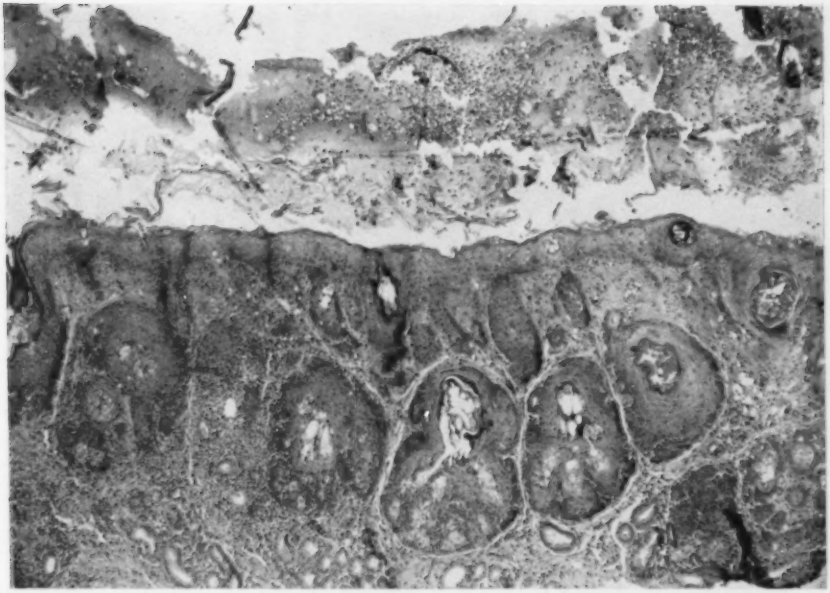


FIG. 6—Diffuse acute inflammatory changes involving epidermis and upper corium. The surface is covered by an exudate containing polymorphonuclear leukocytes. (Senturia and Liebmann.)

FIG. 7—Photomicrograph of the skin of the meatus showing some keratinized material on the surface and dipping into the pilosebaceous orifices. The apocrine acini appear dilated and are lined by flattened cells. (Senturia and Liebmann.)

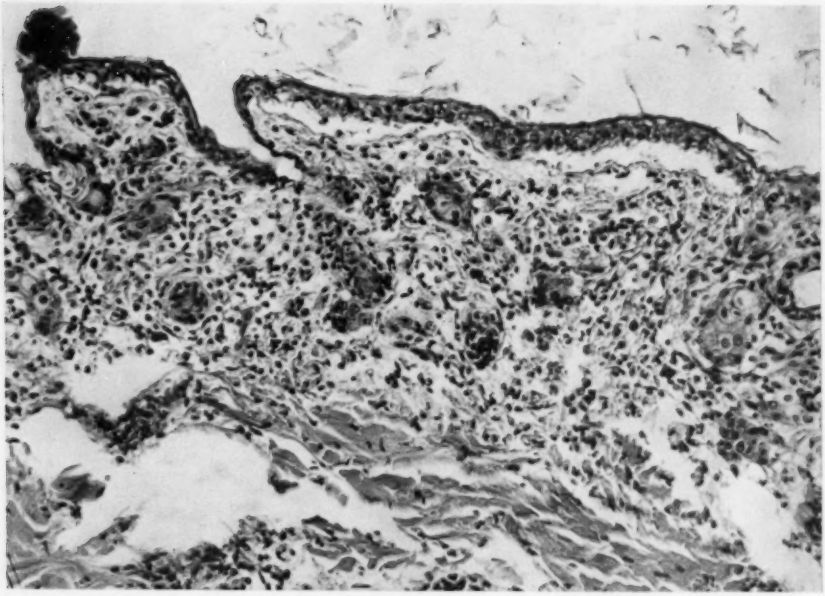


FIG. 8—Photomicrograph of the skin of the meatus, showing diffuse and fairly dense infiltration of lymphocytes and some polymorphonuclear leukocytes in upper corium. (Senturia and Liebmann.)

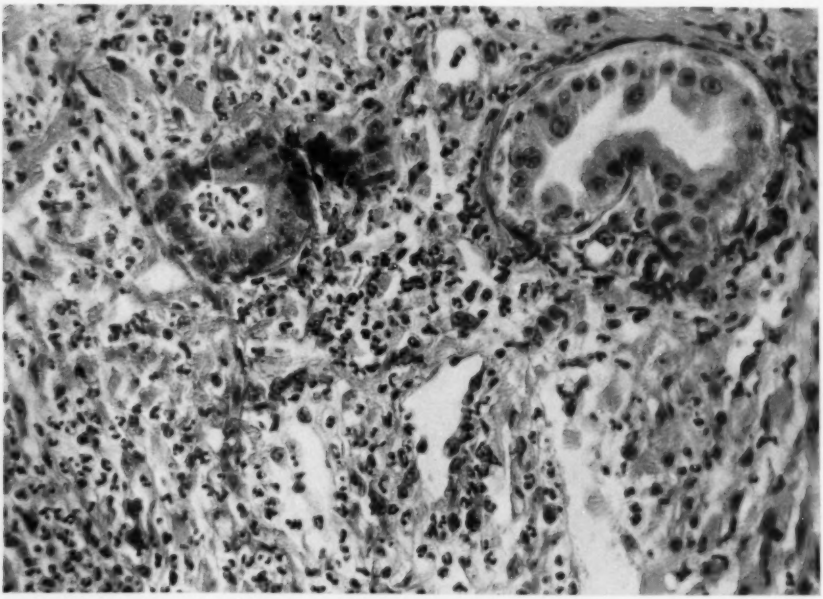


FIG. 9—Section through lower dermis showing diffuse infiltration of polymorphonuclear leukocytes involving lumen of aprocrine acinus. (Senturia and Liebmann.)

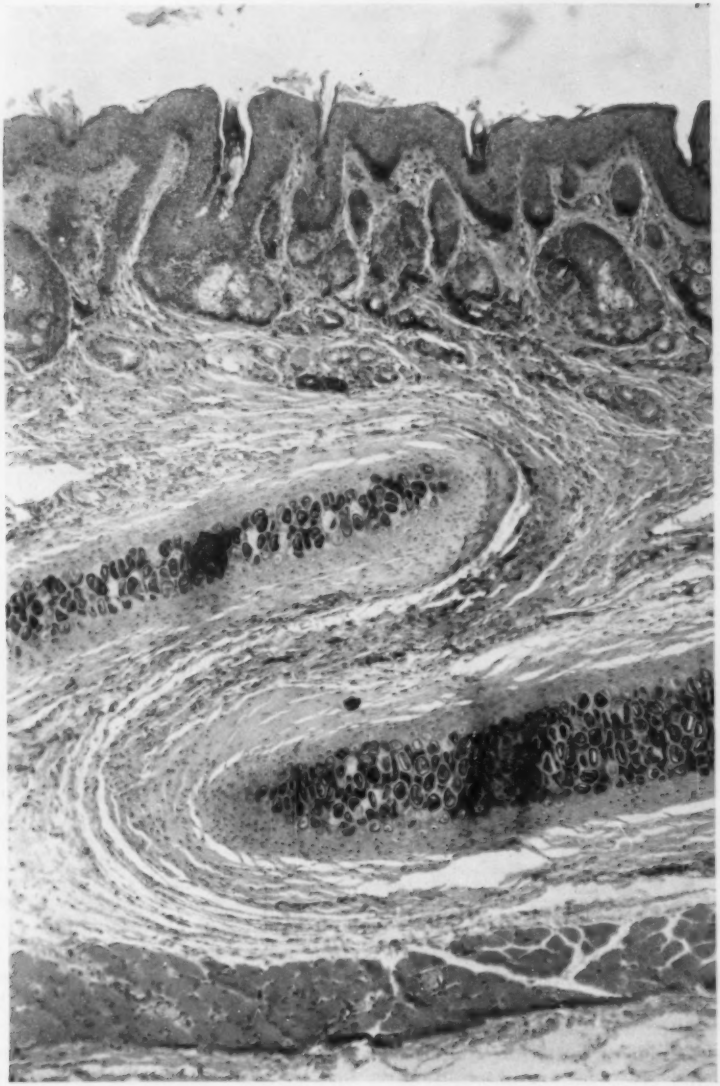


FIG. 10—Section from skin of the external ear canal, showing infiltration extending through a natural fissure between the cartilages. (Senturia and Liebmann.)

loops in the superficial part of the dermis and consisted of dilatation, engorgement, necrosis, thrombosis, and rupture. Vascular changes were also demonstrable in the deeper portions of the corium. Sometimes thrombosis and inflammatory infiltrates were found in vessels closely adjacent to the acini of apocrine glands. There was also a diffuse infiltrate which involved both the super-

FIG. 11—Photomicrograph of skin of external ear canal, showing inflammatory infiltrate, consisting primarily of polymorphonuclear leukocytes, concentrated in deeper part of corium and external to the cartilage. Glandular elements appear to be obliterated or partly obscured by the infiltrate. Epidermis appears acanthotic. (Senturia and Liebmann.)

ficial and the deep corium. In the severest cases, foci were massive and consisted of aggregates of neutrophilic leukocytes with liquefaction. Surrounding them was a dense but diffuse infiltration of lymphocytes and monocytes and a high percentage of eosinophil leukocytes.

The apocrine glands were intimately involved in the inflammatory process. In general, apocrine glands seemed to be atrophic and decreased in size, and for the most part, the glomeruli were embedded in exudate. Leukocytes were sometimes observed within the walls, and in some instances they were seen in masses within the gland space. The sebaceous glands were often involved in the superficial edema and exudate, and polynuclear leukocytes infiltrated the margin of the glands. The holocrine cells, however, appeared normal in size and shape.

Now that we know a little more about the histology and physiology of the skin of the ear canal and about the factors which are conducive to pathologic

TABLE I

INCIDENCE OF OTOMYCOSIS IN VARIOUS FORMS OF EXTERNAL OTITIS AND IN POSTOPERATIVE MASTOIDECTOMY AND FENESTRATION CAVITIES FOLLOWING THE USE OF NEOMYCIN AND HYDROCORTISONE PREPARATIONS

POSTOPERATIVE CAVITIES AND DISEASE TREATED	MEDICATION AND VEHICLE	NUMBER OF EARS TREATED	OTOMYCOSIS	
			NUMBER	PERCENTAGE
Neurogenic Ext. Otitis	O	32	0	0
Mastoid Acute and Chronic Diffuse Ext. Otitis	D & O	82	4	5
Fenestration	D & O & S	57	19	33
Mastoid	D & O	81	23	28

O—Ointment of neomycin and hydrocortisone acetate
D—Aqueous suspension of neomycin and hydrocortisone acetate
S—Clean cavities packed with ointment of neomycin and hydrocortisone acetate at time of surgical operation

changes in it, let us see how this has helped us in preventing or treating external ear infections.

A better understanding of the factors contributing to and of the pathogenesis of external ear infections should provide a clearer and more logical explanation of the clinical picture. It would seem that it is necessary to maintain a normal lipid covering over the skin of the external ear. On the other hand, it is mandatory that old impacted cerumen and adherent exfoliated membranous keratin be removed. The very process of eliminating this retained obstructive protein envelope permits the delivery onto the surface of the skin of the secretions which are necessary to cope successfully with exogenous bacteria or fungi.

It is desirable to avoid excess hydration or maceration of the stratum corneum during periods of high temperature. This is easier said than done. It may, in part, be accomplished by encouraging the use of bathing caps and ear plugs during swimming. The present vogue of underwater swimming should be discouraged unless adequate ear protection is assured.

Since it is usually neither feasible nor practical to remove our patients from environments with high humidity, more vigorous efforts should be made to find an ear formulation which will prevent excessive absorption of moisture by the stratum corneum.

In view of the fact that prophylactic measures are often not utilized and frequently unsuccessful, what progress have we made with therapy? Unquestionably, the most important dermatologic accomplishment in recent years was the demonstrated efficacy of topical corticosteroids in the control of neurogenic and eczematoid dermatoses.[1,28] Miraculous control and sometimes cure of external ear diseases have been obtained when the various forms of hydrocortisone were used alone or combined with neomycin or polymyxin B.[1,20]

But I hasten to stress the phrase "control and sometimes cure," because the misuse and overuse of these wonderful antibiotic and anti-inflammatory agents have produced changes in the skin of ear canals which permit the rapid and uncontrolled growth of filamentous fungi and yeasts. Such changes may be seen in the high incidence of otomycosis found in the series of cases treated with corticosteroids and antibiotics (table I).[21]

No serious otologic sequelae comparable to those reported by our ophthalmologic colleagues have come to our attention. The indiscriminate use of these

agents, however, will inevitably result in mycosis of the middle ear, mastoid, and contiguous structures.

Under test at this time are various agents which when incorporated into ear formulations will be effective, we hope, in preventing the overgrowth of fungi. Of greater importance is the promise of more vigorous efforts to find a prophylactic preparation which will prevent infections of the external ear.

In conclusion, then, we may say with assurance and satisfaction that sound basic progress has been made in the understanding of the prophylaxis and treatment of external ear infections. If interest can be sustained in the study of the basic contributing factors, it may be anticipated that, in the foreseeable future, both bacterial and mycotic infections of the external ear may be prevented or easily controlled.

REFERENCES

1. Baer, Rudolf L., and Litt, Jerome Z.: Treatment of otitis externa with hydrocortisone suspension, J.A.M.A., 155:973-974 (July 10) 1954.
2. Blank, Irvin H.: Factors which influence the water content of the stratum corneum, J. Invest. Dermat., 18:433-440 (June) 1952.
3. ———: Further observations on factors which influence the water content of the stratum corneum, J. Invest. Dermat., 21: 259-271 (Oct.) 1953.
4. Branca, Henry E.: External otitis, a method of therapy and prophylaxis, A.M.A. Arch. Otolaryng., 63:459-465 (May) 1956.
5. Carr, C. D., and Senturia, Ben H.: Unpublished data.
6. Castellani, Aldo, and Chalmers, Albert J.: Manual of Tropical Medicine, ed. 2, London, Tindall and Cox, 1913.
7. Clark, J. V.: Acute otitis externa in India, J. Laryng. & Otol., 61:586-593 (Nov.) 1946.
8. Daggett, W. I.: Desquamative otitis externa in Malta, J. Laryng. & Otol., 57: 427-446 (Oct.) 1943.
9. Hurley, Harry J.; Shelley, Walter B., and Koelle, George B.: The distribution of cholinesterases in human skin, with special reference to eccrine and apocrine sweat glands, J. Invest. Dermat., 21:139-147 (Sept.) 1953.
10. Hurley, Harry J., and Shelley, Walter B.: Apocrine sweat retention in man, the experimental production of an asymptomatic form, J. Invest. Dermat., 22:397-404 (May) 1954.
11. Lobitz, W. C., Jr., and Campbell, C. J.: Physiology of the glands of the human ear canal: preliminary report, J. Invest. Dermat., 19:125-135 (Aug.) 1952.
12. Mole, R. H.: The relative humidity of the skin, J. Physiol., 107:399-411 (Sept.) 1948.
13. Montagna, William: The Structure and Function of Skin, New York, Academic Press Inc., 1956.
14. Perry, Eldon T.; Hurley, Harry J.; Gray, Margaret B., and Shelley, Walter B.: The adrenergic innervation of the apocrine (ceruminous) gland of the human ear canal, J. Invest. Dermat., 25:219-221 (Oct.) 1955.
15. Perry, Eldon T., and Shelley, Walter B.: The histology of the human ear canal with special reference to the ceruminous gland, J. Invest. Dermat., 25:439-451 (Dec.) 1955.
16. Quayle, A. F.: Otitis externa in New Guinea, M. J. Australia, 2:228-231 (Sept. 2) 1944.
17. Sabouraud, R.: Nouvelles recherches sur l'étiologie de la pelade, Ann. de dermat. et syph., 41:545-553, 1910.
18. Senturia, Ben H.: Etiology of external otitis, Laryngoscope, 55:277-293 (June) 1945.
19. ———: Diseases of the External Ear, Springfield, Ill., Charles C Thomas, 1957 (in press).
20. Senturia, Ben H., and Alford, Verna: Hydrocortisone acetate and neomycin in otic infections, Laryngoscope, 64:834-844 (Oct.) 1954.
21. Senturia, Ben H.; Alford, Verna, and Walsh, Theodore E.: Topical hydrocortisone and neomycin in the external ear, Ann. New York Acad. Sc., 61:540-548 (May 27) 1955.
22. Senturia, Ben H., and Liebmann, F. M.: Evaluation of factors which may be of importance in the production of external ear infections, J. Invest. Dermat., 27:291-317, 1957.
23. Sharp, W. B.; John, M. B., and Robison, J. M.: Etiology of otomycosis; an experimental study, Texas State J. Med., 42: 380-384 (Oct.) 1946.
24. Shelley, Walter B., and Hurley, Harry J., Jr.: Methods of exploring human

apocrine sweat gland physiology, A.M.A. Arch. Dermat. & Syph., 66:156-161 (Aug.) 1952.

25. Shelley, Walter B., and Levy, Edwin J.: Histologic observations on the human apocrine sweat gland in health and disease, J. Invest. Dermat., 25:249-263 (Oct.) 1955.
26. Shelley, Walter B., and Perry, Eldon T.: The physiology of the apocrine (ceruminous) gland of the human ear canal, J. Invest. Dermat., 26:13-22 (Jan.) 1956.
27. Sophian, L. H., and Senturia, Ben H.: The pathology of acute diffuse external otitis, Ann. Otol., Rhin. & Laryng., 64: 300-318 (March) 1955.
28. Sulzberger, Marion B., and Witten, V. H.: The effect of topically applied compound F in selected dermatoses, J. Invest. Dermat., 19:101-102 (Aug.) 1952.
29. Sulzberger, Marion B., and Herrmann, Franz: The Clinical Significance of Disturbances in the Delivery of Sweat, Springfield, Illinois, Charles C Thomas, 1954.

DISCUSSION

ELDON T. PERRY, M.D., Detroit: There are several things that I should like to add to what has been said this afternoon.

One is this: There is much to be learned from biopsies of the skin of the canal wall in recalcitrant cases of external otitis. We have now removed tissue for over two hundred such biopsies with no untoward reactions. Undoubtedly, the otologic surgeon would not hesitate to remove tissue for biopsy from the ear canal. I hasten to add that it is very important to send the material to someone who is thoroughly familiar with the histopathology of the skin; otherwise, its value may be greatly lessened. Many dermatoses that occur in the ear canal can be specifically diagnosed under the microscope when the clinical picture is not conclusive.

Second, I want to congratulate Dr. Senturia on his studies of concurrent etiologic factors. Many times we are unable to determine the cause of an entity because we fail to recognize that more than one factor is responsible. Vincent's angina is a good example.

The concept of concurrent etiologic factors was supported indirectly by our experience with subjects whose ear canals were seeded with virulent strains of Pseudomonas aeruginosa. One week after infection we were unable to culture organisms from the ear canals of these patients. We concluded that Pseudomonas alone is probably not capable of producing external otitis. At least we were unable to produce it. The corollary to this, of course, is that we cannot treat external otitis with antibacterial measures alone.

DR. SENTURIA: I should like to comment on the only difference of opinion that seems to have arisen between Dr. Perry and myself. This difference is on the question of whether ear drops or ointments should be used in the treatment of external ear disease.

I should like to suggest that ointments seem to be indicated for the neurogenic category, but drops or aqueous suspensions might be better for the diffuse disease which involves the entire ear canal.

We have found, as you have seen on the last slide, a high incidence of otomycosis following the use of drops and ointments together; yet, only a small number of patients developed the superimposed fungous infestation following the use of ointments alone. There is a high correlation between the incidence of skin disease and the continued wet state of skin which prevails following the excessive or prolonged use of ear drops.

This morning, in the instructional course, the problem of neurogenic external otitis was raised, but we did not have sufficient time to explore it. I think that we have one or two moments left, and I should like to point out that in this neurogenic group, which includes pruritus auris as well as the localized neurodermatitis, we are dealing with a disease involving only the external orifice of the meatus. It would appear that proper therapy should include simple therapeutic preparations like aluminum acetate or Burow's solution, as suggested by Dr. Perry. This can be applied occasionally without difficulty to the involved area. If prompt cure does not occur, we would use medications such as phenol, 1 per cent, or menthol in Vaseline® or alcohol. Finally, if relief is not obtained, we would turn to the simple corticosteroids.

I should like to emphasize the high incidence of Gram-negative bacillus infections superimposed on simple neurodermatitis. I would agree entirely with Dr. Perry that we must be aware of the basis of neurodermatitis, but we must also recognize the frequent superimposed infections due to these Gram-negative bacilli. Consequently, if one uses an agent like polymyxin B sulfate for control of Gram-negative bacilli, a medication like neomycin to inhibit Gram-positive organisms, and the corticosteroids to reduce or minimize eczematization or allergic reactions, one might expect excellent results in the topical treatment of the more severe neurogenic external otitis.

MUCOLYTIC AEROSOLS: THEIR USE IN RESPIRATORY DISEASES

JOSEPH B. MILLER, M.D.
MOBILE, ALABAMA

As the usefulness of an aerosol depends on its deposition within the respiratory passages, it is obvious that reliable techniques and equipment must be utilized to deliver the aerosol solution to its site of action.

Aerosol medications have been formulated because it is not convenient to inject or instill topical medications directly into the bronchial tree except in specific instances, such as tracheotomy cases. Even in such instances it is usually preferable to administer the medication continuously and comfortably as an aerosol. The aerosol technique makes possible the introduction of a medication into the bronchopulmonary passages by the simple procedure of allowing the patient to inhale it in a normal fashion. It is, relatively, a time-consuming method, since the aerosol droplets are so small that it takes a long time to deposit enough of them in the tracheobronchial passages to accomplish their effect. The aerosol route, however, is a practical method of administration, and some medications have been formulated specifically for this method, so we must familiarize ourselves with the proper techniques and equipment for the administration of aerosols.

EQUIPMENT

The administration of aerosols requires the use of (1) a gas, such as oxygen or air, under pressure in a tank, or an electrical air-compressor; (2) suitable tubing of small diameter to connect the gas container or compressor to a nebulizer; (3) the nebulizer itself; (4) suitable nasal attachments or wide-diameter tubing to carry the aerosol from the nebulizer to the patient's nares or to the tent or other enclosure in which the patient is confined; and (5) the suitable enclosures for this purpose, namely face masks, tents, or incubators.

The gas employed has been either oxygen or air. When oxygen or air is piped from a cylinder, a suitable reduction gauge or flowmeter is provided.

The most accurate flowmeter is of the pressure-compensated "floating ball" type (Thorpe tube), i.e., a vertical transparent tube in which a small ball rises and falls with the rate of flow of the gas. However, in clinical practice there are some situations in which it is not necessary to determine oxygen flow with extreme accuracy, and in these situations any ordinary flowmeter will serve for aerosol therapy.

The rate of air (or oxygen) flow required to produce a mist depends on the size of the air-jet orifice of the nebulizer, varying from 2 to 8 liters with different makes. A good guide is to use that rate of flow which, with the nebulizer being used, produces a copious visible mist. Once the incubator or tent is filled with mist, the rate may be reduced somewhat, but for good aerosol therapy it should always be high enough to maintain production of a copious visible mist.

When air compressors are employed, the proper pressure setting, again, is that which is required to produce a

Presented at the Sixty-First Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 14-19, 1956, Chicago.

copious visible mist from the particular nebulizer employed. The exact setting for all compressors cannot be stated dogmatically, as the various makes of compressors differ so widely. Some compressors are made to produce a high pressure with a low volume flow, and others a lower pressure with a higher volume flow. Some are set by the manufacturer at the proper pressure and flow for aerosol use with the best nebulizers and cannot be altered or tampered with, while others can be adjusted for various uses. The safe rules are (1) purchase only those compressors recommended for aerosol use, (2) read and follow the manufacturer's instructions, and always make sure that the pressure is adequate to produce a copious visible mist from the nebulizer.

One precaution in regard to pressure is to avoid having the patient hold the nebulizer directly in his mouth. The oral mucosa cannot tolerate high air or oxygen velocities over a long period of time, and irritation of the tongue, soft palate, or pharynx may result. On the other hand, the nasal mucosa is much less sensitive and can tolerate much higher velocities. Moreover, the application of the aerosol solution to the nasal and sinus mucosa may provide additional clinical benefit. For these reasons, all long-treatment aerosols administered directly, i.e., not in a tent, incubator, or mask, should be administered through the nose rather than through the mouth.

It is also necessary to bear in mind that excessively high oxygen concentrations over long periods of time in newborn infants may cause complications. The time required for aerosol therapy (one to three or four days) appears to be well within the limits of safety. Aerosols can now be administered without high oxygen flows, as nebulizers which operate on as little as two to four liters per minute are available*, and reliable air compressors are also available for use in the nursery.

Some infants who require aerosols also require some additional oxygen for cyanosis and dyspnea. When oxygen is not required, or when aerosols must be administered for an unusually long period of time, it is well to consider switching to an air compressor as the motivating force. When a compressor is used, oxygen may be entirely omitted, or it may still be administered in reduced quantities, as needed, through a separate inlet of the incubator.

The oxygen concentration can thus be adjusted to the infant's minimum requirements without curtailing the use of aerosols. This is facilitated by the use of an oxygen analyzer, which should be a standard piece of equipment in the modern nursery. A suitable air compressor, such as the Aeromist* or DeVilbiss†, should also be standard equipment, as it is much more economical than oxygen or air in cylinders, and its constant availability in the nursery will greatly reduce the amount of oxygen unnecessarily used as the motivating gas for aerosols.

COMPRESSORS

The ideal compressor should deliver oil-free air for all standard nebulizers at a pressure and a volume flow sufficient to produce a copious visible mist. This has already been discussed. The compressor should be light in weight and quiet in operation. It should seldom or never require oiling, and it should be capable of running twenty-four hours a day for several days on end without overheating. The new inexpensive Aeromist and DeVilbiss pumps meet these specifications, as do a great many larger models.

*Hiflow Nebulizer, manufactured by American Medical Products, Inc., Boonton, N. J.

*Aeromist Compressor, manufactured by American Medical Products, Inc., Boonton, N. J.

†DeVilbiss Compressor, manufactured by DeVilbiss Company, Toledo, Ohio.

NEBULIZERS

The nebulizer is the instrument in which the mist, or aerosol, is actually generated. All current nebulizers consist of a spray tip which sprays droplets of a great variety of sizes, and one or more baffles which condense the large droplets and allow only the small floating ones to emerge from the instrument. These particles are so small and so light in weight that they float about and remain suspended in the atmosphere, depositing only when they are inhaled and forced into the turbulent, eddying air stream of the bronchopulmonary passages. As the droplets are made to accelerate their speed, whirl about in eddies, and turn corners, the centrifugal force is sufficient to throw them out and deposit them on the mucosal surface.

It is obvious that the nebulizers must generate droplets with enough mass for centrifugal force to take effect, yet not of such great mass that their weight will keep them from being suspended in the air current long enough to be inhaled into the lungs.

The general size range of such therapeutically effective particles is apparently between 0.5 microns and 5 microns in diameter.[1] The larger particles within this size range—and probably to some extent even somewhat above this size range—are deposited in the upper respiratory passages because their mass is so great that a relatively slight centrifugal force, such as occurs in the nasopharynx, larynx, trachea, and carina, is adequate to cause deposition. The relatively small droplets are not deposited until they reach deeper bronchi and bronchioles, where the tubes are smaller, the air current has great velocity, and the centrifugal force is, therefore, great enough to cause deposition.[7]

There is greater mass, and therefore much more therapeutic material, in the larger drops, but these are ordinarily of little value for lower pulmonary obstructions. In the case of detergent aerosols, however, the low surface tension of these drops in the upper respiratory passages makes them drip downward, so that the terminal bronchioles and alveoli receive drops by both primary deposition and secondary drippage from above.

Nebulizers which are inadequately baffled produce a heavy stream of large drops which do not float but fall out on the patient like rain. These nebulizers are of little value therapeutically and give the physician a false impression of intensive therapy, when actually the patient's respiratory tract is receiving little, if any, aerosol. Some nebulizers have coarse spray jets, often glass or plastic, and the droplets produced at the jet are predominantly large ones, so that when these large drops are baffled out, the remaining mist is so sparse that little therapeutic benefit can be obtained. The best nebulizers have metal jets with small orifices which produce a fine spray, and with two or three baffles, so that they emit a copious fog of floating droplets free of "rain-size" particles.

TUBING

Most nebulizers are made in such a way that a rubber tubing from the oxygen tank or air compressor is slipped onto the air inlet of the nebulizer. In order that the rubber tubing should make a good fit and not slip off frequently, it is necessary that one employ a tubing of relatively small inner diameter and with a relatively thick wall. This type is slightly more difficult to slip onto the nebulizer, but once attached, it is almost a permanent fitting. On the other hand, a rubber tubing with a large inner diameter and a very thin wall has less strength and easily slips off the nebulizer. An *inner* diameter of, at most, three sixteenths of an inch, and a wall thickness of at least an eighth of an inch are usually satisfactory.

If the nebulizer is placed outside of a tent or other enclosure, it is necessary to pipe the aerosol from the nebulizer to the tent. The tubing for this purpose should be of large diameter, so as not to constrict the aerosol flow. In general, it should be at least as wide as the nebulizer orifice to which it is attached, and it should have no constriction at either end—or at any point for that matter—that will impede aerosol flow. It should be light in weight so as not to tilt the nebulizer over, flexible, and completely kink-proof. Corrugated tubing of wide diameter, such as provided by the National Cylinder Gas Company of Chicago, has been the most satisfactory. Whenever tubes of this type are employed, the nebulizer should be placed low and the corrugated tube should slope upwards toward the tent, so that the liquid condensed out in the tube will drip back down into the nebulizer.

TENTS

An ideal tent should provide adequate cooling facilities in all normal ranges of room temperatures *without a motorized circulating air-conditioning system.* The air-conditioning system currently in use in ordinary oxygen tents causes a rapid circulation of the air or oxygen within the tent, and passage over cooling coils in the refrigerator unit. The aerosol is circulated out of the canopy, condensed on the refrigerator coils, and baffled by the fan blades so rapidly that a dense therapeutic mist cannot accumulate. If the patient could be cooled by some method that did not require blower mechanisms and refrigerator coils in the aerosol stream, the aerosol could accumulate and a therapeutic concentration of mist could be obtained.

When an oxygen tent of the conventional type is employed and the circulating mechanism is cut off so that the aerosol can accumulate, the tent becomes too warm and the patient becomes uncomfortable. One solution is to cool the air or oxygen in a "tent-cooler" *before* it reaches the nebulizer. A tent-cooler can be made by coiling copper tubing in an ice-filled beverage cooler and running the oxygen or air through the coil. Another solution is to obtain circulation of air by the Venturi principle, as in the NCG Plymouth tent, rather than with fans.

When small infants are being treated, this problem can be solved by the use of simple plastic boxes containing ice chambers for convection cooling. This is tolerated by very small children and infants because their heat output is relatively small.

Box tents of this type are also available for adults. They are not perfectly satisfactory because they are so small or have such small body openings that the patient is unable to move about or turn over at will. Even for children they are too confining, and the child must often be spread-eagled on the bed to keep him in the proper position. This is a very undesirable situation which could be remedied easily by making the tents larger.

One tent that has been frequently employed is the Croupette*. This is a soft-plastic-covered tent which is somewhat larger than the ones commonly manufactured for infants and, therefore, less confining. It provides adequate cooling for children. It is not made for use with adults, but in some emergencies, due to the lack of suitable adult-sized tents, adults have been successfully treated in it.

The Plymouth tent with nebulizer attachment, manufactured by the National Cylinder Gas Company, is designed to provide a fog of particles of the proper size, and to be large enough, cool enough, and versatile enough for all aerosol and oxygen requirements of both children

*Manufactured by Air-Shields, Inc., Hatboro, Pa.

and adults. It is a closed-top, ice-cooled tent, with a Venturi circulating mechanism instead of a blower, and it has its own compressor for use when oxygen is not required.

There are several types of open-top tents which are satisfactory. In this type of tent, an opening is present in the top for elimination of heat and carbon dioxide, so no cooling mechanism is required. As an aerosol is slightly heavier than air, it tends to settle down around the face, giving the patient a therapeutic concentration. In warm weather, and when very high oxygen concentrations are required, the open-top tent is not adequate.

For home use, and occasionally for hospital use as well, one may fall back on a modification of the old-style croup tent. This is made by draping a bedsheet or a transparent plastic tablecloth loosely around the entire crib. By leaving the top partially or completely open, heat and carbon dioxide are allowed to escape. The nebulizer is placed inside the crib, and it is tied to a bedpost to prevent spilling. The compressor is placed on the floor. If desired, the nebulizer can also be on the floor, with a corrugated tube carrying the aerosol up to the crib area.

If an open-top tent is required and no crib is available, one of the commercially available open-top tents may be used. A makeshift tent can be made by laying a bridge table on the bed, with the top of the table at the head of the bed; by draping a sheet around it and leaving the top open, an open-top tent results.

Home use of aerosols is also becoming practical. Oxygen rental companies are now renting the entire outfit for about two dollars a day. As the average treatment is completed in five days or less, the equipment rental charge is only about ten dollars for the entire illness.

MASKS

Some patients are too weak to hold the nebulizer to the nose; and when continuous therapy is required, this simple technique becomes impractical. On the other hand, tents are resisted by some patients, who are claustrophobic or who just do not feel sick enough to be confined to a tent. For these, the open-top face mask (Eliot, NCG, or Hiflow) offers a practical solution. Actually, all that is needed in most cases is a rig or harness of some kind to hold a nebulizer or aerosol delivery tube in close approximation to the face and pointed in the direction of the nose and mouth. Occasionally, when high oxygen concentrations or high Alevaire® concentrations are required, a tight-fitting mask is used.

Face masks combine well with the nebulizers that fasten directly onto an oxygen gauge, such as the Hiflow 1-OT, the NCG jet humidifier, Emerson, and Humidivaire nebulizers. Whenever such masks are used, the tubing which carries the mist into the mask should be of relatively wide diameter so that aerosol flow is not restricted and the mask is kept filled with aerosol.

Many other masks are available; they are suitable if the aerosol stream is directed to the face without having to pass through valves, bags, narrow tubes, or other obstructions or constrictions that condense out part of the aerosol. The simpler the mask, the better.

Complete units, including nebulizers, compressors, tents, and face masks, are now available from several manufacturers. Many of these are excellent; many are being improved constantly; and new instruments of all types are appearing at frequent intervals.

CATHETERS

As catheter administration is uncomfortable, it is usually reserved for pa-

tients who are either unable to cooperate or unable to tolerate more simple methods, particularly those surgical patients who have not yet fully reacted from anesthesia, and comatose or prostrate patients. However, it is sometimes preferred over other methods even by patients who are alert and cooperative, as it allows them to cough, expectorate, talk, and read more conveniently.

Some nebulizers are built to fit right into the oxygen gauge in place of the usual humidity bottle. These are particularly well suited for use with catheters, e.g., in the surgical recovery room. Special nebulizer attachments are available for catheters (e.g., NCG), and especially small outlets are provided on some nebulizers (e.g., Emerson).

If the nebulizer is a separate unit, it is best to place it on the floor behind the head of the bed and tape it to a leg of the bed to prevent spilling. It may also be suspended from the oxygen gauge or some other convenient hanging point. A two-hole rubber stopper is placed in the nebulizer, so that two nasal catheters can be attached to it by rubber tubing. The catheters are then taped to the face so that each catheter tip inserts about one-fourth inch into the corresponding naris.

Instead of rubber catheters, it may be more convenient to use the metal tubes which attach to a head band and which are often employed for oxygen administration.

INCUBATORS

The Armstrong X-4 incubator* is a satisfactory and widely distributed incubator for aerosol use. Its simple box-like construction provides it with the ability to be filled with an aerosol mist and to retain that mist in high concentration. Almost any one of the nebulizers available is suitable in this incubator. The manufacturer also provides a nebulizer designed particularly for use with this incubator. This nebulizer has a fine metal jet and is well baffled so that it produces a dense fog of fine droplets. The same manufacturer produces a deluxe incubator with a built-in nebulizer and armholes which help retain a constant concentration of aerosol as well as warmth and oxygen.

The Emerson incubator* is also satisfactory, produces an adequate fog, and requires little cleaning or other maintenance.

The Penn 600 incubator† is a new and highly satisfactory incubator. It was designed with aerosol administration in mind, has a built-in nebulizer, and provides an excellent therapeutic fog.

There are many other types of incubators which are satisfactory, particularly those which have been modified with aerosol therapy in mind.

CARE OF EQUIPMENT

The prime requisite for good care of aerosol equipment is frequent thorough cleaning. All nebulizers, tubes, tents, masks, and incubators should be cleansed with soap and water after every use. All nebulizers have relatively small jets, and these are easily clogged by small particles of lint or dust. This is particularly true of the fluid jet, as the air jet usually maintains patency by its own air blast. The fluid jet can usually be cleaned by probing or by forcing water through it backwards under pressure, using a syringe and a small hypodermic needle.

If a nebulizer is being used continuously, it should be cleaned at least every twenty-four hours to prevent clogging.

*The Gordon Armstrong Co., Inc., Bulkley Bldg., 1501 Euclid Ave., Cleveland 15.

*J. H. Emerson Co., 22 Cottage Park Ave., Cambridge 40, Mass.

†American Sterilizer Co., Erie, Pa.

Metal jets are preferable because glass jets are easily broken by cleaning procedures, and plastic jets are gradually enlarged by probing or reaming, and finally lose their nebulizing characteristics.

It is best to autoclave the nebulizer after each use when it is used in cases of infectious disease, particularly in nurseries for newborn and premature infants. There should be no transferring or borrowing of any equipment between the nurseries and the rest of the hospital without prior sterilization. When equipment is clogged or not operating properly, it should be repaired or replaced immediately, to obviate the necessity for using an inadequate instrument in an emergency.

THERAPEUTIC AEROSOLS

The therapeutic aerosols available today are chiefly those employed for respiratory obstructions due to bronchospasm, retained secretions, mucosal edema, infection, and foam (pulmonary edema). Obstructions due to new growths or to abnormal anatomy will not be considered in this discussion, for they are not presently amenable to aerosol therapy.

For relief of bronchospasm, only two aerosol medications are of practical value, although they are marketed in numerous modifications and combinations. These are epinephrine (1 per cent) and isopropylarterenol (0.5 per cent and 1 per cent). Epinephrine is effective in a wide variety of cases, but isopropylarterenol is preferred by many because of its greater potency in cases which do respond, its longer action, and its relative freedom from side effects and the problem of tolerance. A few whiffs of either medication from a pocket nebulizer are sufficient to induce relief within two to three minutes in those patients who respond.

The aerosol medications currently available for loosening retained secretions so that they can be expectorated are steam, "cool steam" (nebulized water), proteolytic enzymes, and detergents.

Both hot and cool water inhalations are only feebly effective therapeutically. The enzymes thus far employed have proved too irritating for practical use. Of all the detergents reported, only one has been found so far which is effective and safe for human use.[12] This is superinone, the active ingredient of Alevaire®.

One drawback in the use of Alevaire® has been the slowness of its effect, due to the fact that it works by a physical wetting and dissolving action (lowering of surface tension) rather than by a rapid chemical or enzymatic destruction.[28] More prolonged treatment is required, which in turn necessitates larger nebulizers, air compressors which run longer, more comfortable face masks, and special types of tents. Thus, although the general principles of aerosol administration hold true, many of the techniques and much of the equipment for Alevaire® administration are new. Since no therapeutic benefit can be obtained by short treatments with unsuitable equipment, an attempt is being made here to discuss adequate techniques and equipment.

Mucolytic aerosol therapy is indicated in laryngotracheobronchitis and other croup diseases of children; in mucus-obstructive respiratory conditions of the newborn; in fibrocystic disease; and in chronic sinobronchitis, bronchiectasis, intrinsic asthma, and emphysema of adults.[2-6,8-11,15,18,19,23-28] Sadove and others have also reported favorably on the use of mucolytic aerosols in the recovery room, for thinning out and eliminating retained postoperative secretions before they can plug the bronchioles of the patient and cause postoperative atelectasis and pneumonia.[20-22]

Mucosal edema of the respiratory passageway may be relieved by the aerosol administration of certain topical vasoconstrictors. This not only enlarges the lumens of the bronchioles, but also relieves edema of the turbinates and sinus ostia, favoring better drainage and more physiological conditions in the upper respiratory tract. Neo-Synephrine Hydrochloride® is well suited for this use, since it is effective and free of systemic side reactions even with prolonged administration. Recent personal experience with norepinephrine (Levophed®) aerosol indicates that it apparently has an unusually potent and prolonged vasoconstrictor effect and is free of systemic side reactions.

Another form of respiratory obstruction, namely, pulmonary edema due to cardiac failure of the left ventricle, is now being treated with a much more potent antifoaming agent (Defomair®) than was previously available. Present indications are that this defoaming aerosol will be helpful in preventing death due to respiratory obstruction from edema froth while the underlying cardiac difficulty is being brought under control.

One of the most notable advances in topical anesthesia for bronchography and bronchoscopy, particularly in children, is the admixture of surface anesthetics with detergent aerosols.[12-14,17] One such solution is 0.5 per cent Pontocaine Hydrochloride® in 8 cc. of superinone and glycerin, designated "Pontocaine Hydrochloride Aerosol Solution®." When this solution is nebulized and inhaled, as described,[17] the technique results in the deposition of only about 5 mg. of Pontocaine Hydrochloride® spread over the entire bronchial tree. This is by far the smallest dosage ever effectively employed for widespread topical anesthesia of the entire respiratory passageway. This new aerosol brings to the field of topical anesthesia greater degrees of comfort, safety, and effectiveness than have been attainable previously.

OFFICE TECHNIQUES

The technique of administering simple bronchodilators in the office consists in the nebulization of a few whiffs of epinephrine or isopropylarterenol directly into the patient's mouth or nose with a hand nebulizer such as the DeVilbiss 40® or Vaponephrine®. The nebulizer can be loaded once and used repeatedly for many patients by the use of sterilizable mouthpieces, made by cutting three-inch lengths of half-inch rubber tubing. The nebulizer should be kept stoppered and in a box, or in a drawer of the examining table, to prevent deterioration (brown discoloration) of the solution by air or light. As these agents give relief in two to three minutes in patients who respond, this procedure is useful in determining whether or not further bronchodilating medications must be administered while the patient is still in the office.

This simple hand-bulb technique is not applicable to the administration of Alevaire®, as the volume of Alevaire® required for effect is so much greater. It requires approximately 3,500 contractions of the hand on the bulb to nebulize 10 cc. of Alevaire®, and the hand becomes tired after only twenty or thirty squeezes. Therefore, an electric air compressor is the most practical motivating force for Alevaire®. The nebulizer employed is the DeVilbiss 640®, and this is held to the nose (not the mouth), loosely and comfortably (not jammed in airtight). The patient is instructed to relax and breathe normally (not deeply or forcefully), so that he will not become tired and tense. It is well to limit the duration of the first treatment to twenty or thirty minutes if the patient is a tense individual.

A patient whose sole or predominant problem is retained secretions of long standing can obtain complete relief from the secretions by inhaling 10 cc. of Alevaire® daily for about fourteen days in the manner just described. The response in this type of patient follows a typical pattern. He expectorates a few thick semisolid plugs for the first two or three days; viscous yellow or green mucus for the next few days; then thinner mucus with small flecks of green or yellow for a few days; then clear mucus; and finally no secretions at all by about the fourteenth day. This draining-out process is accompanied by marked relief of cough, wheeze, and dyspnea. The occasional patient who fails to obtain complete relief of secretions due to anatomical damage, or other factors, usually prefers to purchase his own small compressor for home use so that he can control his secretions by inhaling Alevaire® twenty to thirty minutes at bedtime, when needed.

Since respiratory illnesses, such as asthma and emphysema, have multiple manifestations, such as spasm, secretions, and edema, aerosol medications for all these conditions are often combined and used simultaneously. The following prescription is an example of a combination satisfactory for office use:

Isuprel Hydrochloride®, 1 per cent	3 drops
Neo-Synephrine Hydrochloride®, 10 per cent (ophthalmic solution)	1 cc.
Alevaire® sufficient to make	10 cc.

If infection is present, one may also add penicillin, 500,000 units, and streptomycin, 0.5 grams, or antibiotics may be administered by some other route.

All these drugs are mutually compatible but must be freshly mixed at the time of administration, as the solution contains no preservatives and will soon deteriorate on standing, particularly the Isuprel Hydrochloride®.

If administration of the solution by the direct nasal technique is not accepted well by the patient, an open-top face mask is usually an acceptable alternative. In this case the same solution is used but a large nebulizer, such as the Hiflow nebulizer with open-top face mask, is employed. In the case of small children, either method is usually accepted if the child is allowed to take his treatment while sitting on his mother's lap, particularly if the nebulizer or mask is held to the child's face by the mother.

HOME TECHNIQUES

A. The home technique may be essentially the same as the office technique (direct nasal application or open-top face mask) and may employ essentially the same equipment (small compressor and nebulizer, and possibly face mask) and the same solutions, but the treatment may be given several times a day for as many days as desired. Alevaire® is now available in a 60-cc. bottle, so a prescription for twelve treatments may be written as follows:

Neo-Synephrine Hydrochloride®, 10 per cent (ophthalmic solution)	5 cc.
Penicillin, crystalline	3,000,000 units
Streptomycin	3 grams
Alevaire® sufficient to make	60 cc.

Sig.: Inhale one teaspoon (5 cc.) from DeVilbiss 640® nebulizer two to three times a day. Keep in refrigerator. If wheezing (spasm) is present, add 3 drops of fresh Isuprel Hydrochloride® to the 5 cc. of solution in the nebulizer, just at the beginning of each administration.

Equipment for the nebulization of Alevaire® is now available on a rental basis in some communities. If attacks of the disorder are recurrent, or if the disease is a chronic one, it is usually advisable for the patient to buy his own equipment.

B. Continuous overnight therapy is also easily obtained at home. A simple open-top croup tent may be rented, purchased, or made (as described under the

section on Tents), and a small compressor and a large nebulizer, such as the Hi-flow®, are used. The nebulizer can be run all night. In overnight therapy, the Neo-Synephrine Hydrochloride® may still be added to the Alevaire® in a concentration of 0.2 per cent (10 cc. of 10 per cent ophthalmic Neo-Synephrine Hydrochloride® solution in 500 cc. of Alevaire® provides a 0.2 per cent concentration of Neo-Synephrine Hydrochloride®). The Isuprel Hydrochloride® may be omitted or given intermittently only as needed to relieve wheezing (three to six squeezes of the rubber bulb of the small hand nebulizer containing it, every two to three hours). The antibiotics are usually given parenterally, but they may also be added to the aerosol if indicated (penicillin, 1 million units per day, and streptomycin, 1 gram per day). For example:

Neo-Synephrine Hydrochloride®, 10 per cent (ophthalmic solution)	10 cc.
Penicillin	1,000,000 units
Streptomycin	1 gram
Alevaire® sufficient to make	500 cc.

One advantage of adding Neo-Synephrine Hydrochloride® to the solution for overnight administration is that the child, who might otherwise wake up every few hours with a stuffy nose, is able to obtain a complete night's rest. Neo-Synephrine Hydrochloride® is also useful for reducing laryngeal edema in laryngeal croup, and bronchiolar edema in bronchiolitis.

HOSPITAL TECHNIQUES

Alevaire® may be administered in the hospital by the same techniques described for office or home use. In addition, several specialized techniques are applicable (incubator, tent, face mask, and catheters). These methods have been discussed under the respective headings. The solutions used are the ones just described. Patients with severe cases of croup are best hospitalized for continuous therapy, as well as for close observation in case tracheotomy becomes necessary, oxygen must be administered or some other special therapy is required.

Of course all other methods of therapy are employed in all cases, as indicated, including digitalis, fluids, electrolytes, transfusions, and bronchoscopic suction. The aerosol treatment is an adjunct to, not a substitute for, total rational management.

SUMMARY

The benefits of therapeutic aerosols have, until recently, been restricted very considerably by the lack of suitable equipment for their administration. Suitable compressors, nebulizers, tents, masks, catheters, and incubators are now available. The indications for use and the virtues of each type of equipment have been presented. The drugs for combating thick secretions, bronchospasm, mucosal edema, foam, and infection of the respiratory tract have been discussed, and aerosol techniques for their administration in the home, the office, and the hospital have been described.

REFERENCES

1. Abramson, Harold A.: Present Status of Aerosol Therapy of the Lungs and Bronchi, Progress in the Science of Allergy, New York, S. Karger, 1950.
2. Affeldt, John E.: Recent advances in the treatment of poliomyelitis, J.A.M.A., 156: 12-15 (Sept. 4) 1954.
3. Arnold, W. O.: Cystic lung disease and other ventilatory problems, J. Arkansas M. Soc., 51:65-69 (Aug.) 1954.
4. Baxter, Earl H.: Mucoviscidosis; its clinical aspects and treatment, Postgrad. Med., 15:334-341 (April) 1954.
5. Denton, Robert: Continuous nebulization therapy: a technique for the treatment of abnormal respiration in the newborn premature infant, Pediat. Clin. N. Amer., 3:625-638 (Aug.) 1954.

6. Ellis, F. Henry, Jr.; Logan, George B.; Pender, John W., and Kirklin, John W.: Problems in the thoracic surgical management of infants and children, J.A.M.A., 155:951-954 (July 10) 1954.
7. Findeisen, W.: Uber das Absetzen kleiner, in der Luft suspendierter Teilchen in der menshlichen Lunge bei der Atmung, Arch. f. d. ges. Phys. (Pfluger's), 236: 367-379, 1935.
8. Francke, Don E.: New approved drugs: Triton WR-1339 solution, Alevaire, Univ. Michigan M. Bull., 20:72-73 (March) 1954.
9. Hensen-Pruss, O. C., and Charlton, John D.: Emphysema in the aged, J. Am. Geriatric Soc., 2:153-170 (March) 1954.
10. Henrickson, W. E.: Laryngeal diphtheria: Alevaire in the management; report of a case, Missouri Med., 51:202-203 (March) 1954.
11. Kracum, Vincent D., and Collins, Vincent J.: Aerosol administration of Alevaire. 1. Technics, New York State J. Med., 54:2083-2086 (July 15) 1954.
12. Miller, Joseph B., and Abramson, Harold A.: Surface anesthesia of the respiratory mucosa by nebulization, Quart. Bull., Sea View Hosp., 11:1-6 (Jan.) 1949.
13. Miller, Joseph B.; Mann, F., and Abramson, Harold A.: A method for topical anesthesia by nebulization of local anesthetics, Dis. of Chest, 16:408-419 (Oct.) 1949.
14. Miller, Joseph B.; Conyers, William H., Jr., and Dinhoffer, Norman: Simple safe bronchographic technique for children, J. Pediat., 36:721-727 (June) 1950.
15. Miller, Joseph B.; Abramson, Harold A., and Ratner, Bret: Aerosol streptomycin treatment of advanced pulmonary tuberculosis in children, Am. J. Dis. Child., 80:207-237 (Aug.) 1950.
16. Miller, Joseph B., and Boyer, E. H.: A nontoxic detergent for aerosol use in dissolving viscid bronchopulmonary secretions, J. Pediat., 40:767-771 (June) 1952.
17. Miller, Joseph B.; Dinhoffer, Norman, and Conyers, William H., Jr.: A new bronchographic technique employing aerosol anaesthesia; further experiences in children and adults, Am. J. Roentgenol., 68:229-239 (Aug.) 1952.
18. Miller, Joseph B., et al.: Alevaire inhalation for eliminating secretions in asthma, sinusitis, bronchitis and bronchiectasis of adults, a preliminary report, Ann. Allergy, 12:611-626 (Sept.-Oct.) 1954.
19. Ravenel, Samuel F.: New technique of humidification in pediatrics, J.A.M.A., 151:707-711 (Feb. 28) 1953.
20. Sadove, Max S.: Use of Alevaire in anesthesiology for prevention of postoperative atelectasis and pneumonia, Champaign Medical Society, March 12, 1953.
21. Sadove, Max S.; Gittelson, Lloyd A.; Wyant, Gordon M., and Holinger, Paul H.: The maintenance of an efficient tracheobronchial airway, Am. Prac. & Digest Treat., 5:11-16 (Jan.) 1954.
22. Sadove, Max S.; Miller, Cecelia E., and Shima, Arthur T.: Postoperative aerosol therapy, J.A.M.A., 156:759-763 (Oct. 23) 1954.
23. Sanford, Heyworth N.: Some problems in care of the newborn, J.M.A. Georgia, 42:369-372 (Aug.) 1953.
24. ———: Factors in infant care, Illinois M. J., 105:246-248 (May) 1954.
25. Segal, M. S.; Radovsky, S. S., and Salomon, A.: Chronic cor pulmonale and its management, J. Am. Geriatric Soc., 2: 335-343 (June) 1954.
26. Segal, M. S.; Salomon, A., and Herschfus, J. A.: Treatment of chronic pulmonary emphysema, Am. Rev. Tuberc., 69:915-929 (June) 1954.
27. Stiles, Frank C.: Aerosol therapy in children, Wisconsin M. J., 52:543-545 (Oct.) 1953.
28. Tainter, M. L.; Nachod, F. C., and Bird, J. G.: Alevaire as a mucolytic agent, New England J. Med., 253:764 (Nov. 3) 1955.

ADVANCED CARCINOMA OF THE LARYNX AND HYPOPHARYNX: SURGICAL EXPERIENCES

MAURICE F. SNITMAN, M.D.
ARTHUR LOEWY, M.D.
CHICAGO, ILLINOIS

THE total background of experience in the care of carcinoma of the larynx has demonstrated that when the lesion is small and presumably of recent origin, the chances of survival have improved. It has also been experienced that such tumors, when located in areas in which the sparsity of lymphatic vessels lessens the potential spread of the disease, are more likely to have a good prognosis. Part of the improvement has resulted from advances in surgical skills, in improved supportive measures, and in an increased understanding of the problems arising from the inherent tendency of tumor to persist and to spread, so that under current standards, small lesions of the vocal cord rarely constitute a surgical challenge. This does not imply that results are completely favorable, but on the basis of several criteria the type of surgery or possible choice of irradiation is fairly well established, and the over-all long-range results are good. Evaluation of surgical failures generally reveals the choice of an inadequate type of surgery; that is, either the field of resection has been so narrow that the problem of lymphatic spread has not been adequately dealt with, or the amount of submucosal direct extension was not appreciated at the time of surgery.

These observations have had the tendency to encourage adequate surgical approach to carcinoma of the larynx, and when the principle of resection in continuity of the tumor-bearing area and its anticipated area of lymphatic spread was applied, there was a great improvement in survival rate in those cases in which the tumor was situated in one of the areas providing a rich lymphatic bed. This includes such areas as the supraglottic area, the aryepiglottic folds, the valleculae, and the pyriform sinuses. In the past, many such lesions were readily judged inoperable and were relegated to the radiologist for palliative care. It *was* "palliative" irradiation, because the radiologist's over-all results were no better than the disappointing results previously obtained by the surgeon. It was a rare occasion when a patient experienced comfortable survival, of moderate duration, with both modalities. However, in general, the poor outcome so widely experienced with radiation therapy in this type of tumor has further encouraged an "in-continuity" surgical approach. While five-year cure rates are not generally available, the early results of surgical intervention guided by wide exposure of accessible areas, and the monobloc resection of tumors of the larynx and hypopharynx and their lymphatic bed have been encouraging in the experiences of many.

In performing the surgical operation with the adequacy that may be required, thoughts of survival of the patient must supplant thoughts of preservation of organ function or of the ultimate cosmesis. Although the disregard of these factors in the surgical approach has been termed "radical," the observa-

From the Department of Otolaryngology of the University of Illinois College of Medicine.

Presented at the Sixty-First Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 14-19, 1956, Chicago.

tion of patients treated by irradiation, or of those whose tumor has gone to advanced stages without treatment, clearly shows the destructive character of the tumors in regard to function and appearance. Hence, we speak of adequate surgery rather than radical surgery. Resection may include the entire hypopharynx, the base of the tongue, or lateral pharyngeal wall up to the nasopharynx. The guiding principle in the technical aspect of the surgical approach is to create a wide exposure beyond the area of involvement. It is only by wide exposure that adequate resection can be made with assurance. The results obtained, we feel, have improved proportionately to the degree to which a truly anatomical dissection and resection has been achieved.

Evaluation of the failures in treating surgically the more extensive type of laryngopharyngeal carcinomas has presented some encouragement, especially when those failures are compared with the results of the essentially palliative radiation therapy of similar tumors. These encouraging aspects will be discussed in further detail, since they have proved to be a stimulus to use of the surgical approach in cases of extensive, and presumably more advanced, carcinoma of the larynx and hypopharynx, both with and without clinical evidence of metastatic spread.

In employing surgical management of advanced carcinoma of the larynx and hypopharynx, we are guided in the evaluation of individual cases by the realization that the primary tumor is generally resectable, regardless of size or extent. Thus, evaluation of feasibility of surgical intervention is based on the general health of the patient and the extent of metastatic spread. Known distant metastasis to lung or mediastinum would constitute an absolute contraindication under current standards. The finding of fixed cervical lymph nodes, indicating that tumor cells have broken through to infiltrate neck structures, would also constitute a contraindication at the present time, since this finding implies that the tumor is no longer confined within the lymphatic bed. The over-all results in the cases of clinically evident bilateral involvement of the cervical lymph nodes at the time of first examination have been poor enough to demand careful evaluation of the extent and distribution of spread before advocating surgical management.

Examination of general nutritional status, cardiovascular and renal mechanisms and sensorium results in very few absolute contraindications to the surgical procedure or to general anesthesia, especially in view of current means of exerting control over most of the patient's responses to surgery by the adjuvant forms of therapy and management. Certainly, our increasing understanding of changes in body fluid and of the use of antibiotics has enhanced surgical approaches that could previously have been made only in theory. Age of the patient is never a primary consideration. Previous radiation therapy, in our experience, has definitely proved to affect the response to subsequent surgery: there is delayed primary healing; there is a high probability of bizarre spread following effects of radiation on lymphatics; and if extensive reconstruction is required, successful transfer of flaps is hindered by a poor bed for the graft.

The unfavorable course following purely palliative irradiation coupled with the feasibility of adequate surgery has encouraged a more enthusiastic surgical attack on that group of tumors of the larynx and hypopharynx that would generally be considered as "advanced" and inoperable. As a result of a growing backlog of surgical experiences with this group of advanced tumors, several generalities have become apparent. The immediate postoperative course has generally been without event. Mortality has not differed from the rate of death en-

countered in the management of less advanced tumors of the larynx. There have been two-year and three-year survivals without evidence of disease, but in the series under care and observation at the University of Illinois hospitals, significant five-year survival figures are not yet available. The immediate results from the standpoint of permitting the patient to return to his home and his occupation have been most gratifying to those who are concerned with the day-to-day care. A study of the so-called failures has not been without its encouraging features. This encouragement is even more remarkable when we compare the course of the disease in cases in which radiation has failed with that in cases receiving surgical intervention for advanced tumor. Cases in which radiation has failed are likely to evidence several characteristic features. There is initial discomfort; there are problems of airway maintenance; and there are problems of nutrition. Spread of the tumor, both direct and metastatic, following radiation therapy that has not eradicated disease occurs by virtue of survival of the most resistant cells; therefore, the local persistence and growth of these cells present an insurmountable problem at the present time. As spread continues, there is pain. Feeding problems and airway maintenance problems increase. Tracheotomy and, frequently, gastrostomy are required. The terminal episode is usually the result of ulceration and erosion of major blood vessels.

By contrast, when surgical methods fall short of eradicating disease and preserving life, the course of the disease, nonetheless, seems to present several advantages for the patient. Airway maintenance is not a problem because of the tracheostomy. Patients get along well without a tracheotomy tube, and little caution is required. Feeding is rarely a problem for two reasons: (1) when the primary tumor area is laryngeal, surgical excision generally precludes its further possible invasion and encroachment of the hypopharynx or esophagus, and (2) when the hypopharynx is resected, a cervical esophagostomy is established; this affords (when chances for survival may contraindicate reconstruction) a feeding route that is superior in many aspects to that afforded by a gastrostomy. Because of the inadvertent resection of sensory nerves at the time of surgery, local pain is an infrequent complaint, and patients are comfortable and ambulatory until late in the progress of the disease. The ultimate exodus is most likely to be the result of distant metastatic lesions, usually pulmonary or mediastinal. While its finality does not differ from that of radiation failure, it is more likely to occur under better-prepared circumstances.

Treatment of advanced carcinoma of larynx and hypopharynx is fundamentally a surgical problem. We do not imply that every patient with advanced carcinoma of the larynx or hypopharynx should undergo surgical extirpation of the lesion, but in view of current indications of operability, there are relatively few who demonstrate absolute contraindications to surgical management when they first seek medical aid. In the past, patients with advanced tumors were referred for radiation therapy, not with the hope of cure but for presumed palliation, although such treatment usually did not ease the course of the disease in lesions of this type. Many patients can now be offered a useful extension of their life span when given the benefit of surgical management, and when survival is not the outcome, there are less-than-cure benefits from the surgical approach that should not be overlooked in the evaluation of the "case" as a person.

DISCUSSION

DR. SNITMAN: (Slide) After examining the patient shown in the accompanying slide, I made a diagnosis of postcricoid carcinoma and recommended a total laryngectomy. The

recommendation rather shocked the patient and she sought radiation therapy. The radiologist refused to treat the patient and recommended that I remove her larynx.

After having isolated the larynx and opened the pharynx, I was shocked to find that this patient had, at the lower end of the pharynx, an annular carcinoma similar to that seen in the large bowel. I could not return the larynx—restore the nerves to the larynx, suture muscles, and restore function. I had to go on, and so I removed the larynx and pharynx. I fixed the oral stoma to the skin, and made the esophageal stoma a little distance from the tracheal stoma. I hoped that in some way I could reconstruct the pharynx. I toyed with the idea of a rubber tube in the slot, so to speak, between the oral stoma and the esophageal stoma. This operation was done in the summer of 1944. That is over twelve years ago. I did not expect to remove the whole pharynx at that time. It was an unexpected experience. The patient got along only fairly well and developed some permeation of the tissues on both sides of the neck, which I managed to eradicate with radon seeds, effecting interstitial radiation by direct approach. At no time, of course, was there a feeding or air-maintenance problem. I took care of this patient until her decease.

The experience of operating on this patient did not deter me from carrying out this type of surgical intervention on any patient with laryngeal carcinoma which was operable. Rarely is a lesion in the pharynx or larynx so extensive that it is not resectable, and one should not fear the need for removal of the entire pharynx because physiological re-establishments can be made quite easily. We have made such re-establishment on quite a few occasions during the past several years.

Over five and one-half years ago, another patient underwent a partial closure anteriorly. Dr. Loewy did not mention, but I want you to know, that this patient had a midline lesion. He had no adenopathy and no radiation of the neck; and if an adenopathy had developed we could have performed a radical neck dissection.

I wonder if the decision, sometimes advocated, to give a little radiation until the nodes melt away and then to perform a surgical operation is scientific. If we give radiation to a patient with the hope of sterilizing the lesion and if we then perform a radical operation where the radiation has failed, it has been our experience, unfortunately, that the recurrence is, as Dr. Loewy stated, very bizarre. That patient really becomes a terrific problem, not only because of the bizarre spread but because of the changes in the tissues traumatized by both irradiation and surgical intervention.

One more thing. In this state of our work on laryngeal carcinoma and pharyngeal carcinoma, I think that the early case isn't a great problem. Many of us are routinely performing these procedures, but I feel that prompt surgical intervention, wide exposure, and adequate removal of the lesion in patients who in the past were offered palliative radiation rather than surgical operation, is now the challenge, and you will find, I am sure, as we have found, that the results as to morbidity and mortality certainly are on the positive side for surgical management.

RELATIONSHIP BETWEEN ACCOMMODATION AND CONVERGENCE

GOODWIN M. BREININ, M.D.
NEW YORK, NEW YORK

A TRULY rational approach to the therapy of accommodative esotropia must be based on a clear understanding of the mechanisms underlying vergence movements and, in particular, of the roles of accommodative and fusional vergence. To the extent that we lack scientific insight into these mechanisms, we cannot claim to have achieved such an approach. There are, nevertheless, significant guideposts which point the way to better clinical management of accommodative esotropia. Recent and current research bids fair to clarify many obscure features of this formidable group of dysfunctions of eye muscles.

The principles enunciated by Donders have held sway to this day. The refractive nature of accommodative esotropia is implicit in the fact that most children suffering from this dysfunction have a hypermetropia exceeding the norm and that correction of the hypermetropia with lenses abolishes the esotropia. This does not mean that hypermetropia is the sole cause of esotropia. Many esotropic individuals do not differ from the norm in the degree of hypermetropia—indeed, some individuals may have little or no significant refractive error; nor do all hypermetropic persons squint. Nevertheless, the basic disturbance is chiefly an excess of accommodative convergence over that required for binocular fixation coupled with a failure of corrective reflex fusional adjustment. A hereditary element has been noted frequently in cases of strabismus, but exactly what defect is inherited is not known.

Let us consider the mechanisms of vergence innervation. Maddox classified the vergences as *proximal, tonic, accommodative,* and *fusional.** It is important to realize that not all of these forms of vergence are necessarily to be found in a given individual — indeed, one or more may be lacking.

Proximal Vergence

We may dispose of the poorly understood proximal or near factor with a few remarks. At this time it is not clear whether this is an independent entity or merely a psychological facilitation of other types of convergence innervation. It amounts to only a few prism diopters in the normal subject, but it may be considerably greater in individuals with strabismus. It is clinically significant in haploscopic testing, in which the degree of esotropia appears to be greater than when tested by the prism-and-cover test.

Tonic Vergence

Tonic vergence is that basic innervation which carries the eyes to the dissociated position for distance fixation when

From the Department of Ophthalmology, New York University Postgraduate Medical School.

Presented at the Sixty-First Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 14-19, 1956, Chicago.

*This classification has recently been further elaborated by Tait.

accommodation and fusion are suspended. It is the resultant of many primitive reflex and quasi-reflex mechanisms, such as cortical, labyrinthine, proprioceptive and visual, and of unknown sources which funnel into the opposed channels of convergence and divergence, thus modifying the basic anatomical position of the eyes (fig. 1). Electromyography has shown that all innervation to the extraocular muscles is obtunded in the surgical plane of general anesthesia, thus revealing the true anatomical position free of tonic influences. The seldom-realized ideal, orthophoria, reflects a nice balance of these forces, with the vector resultant a complete absence of deviation of the eyes under the conditions cited.

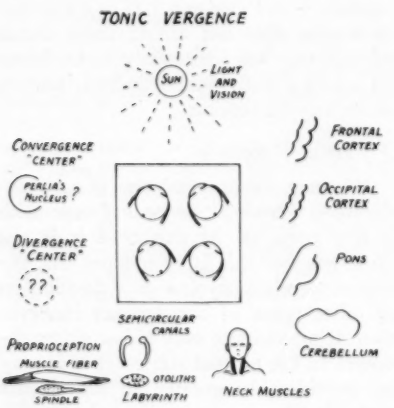


FIG. 1—Reflex and quasi-reflex mechanisms resulting in tonic vergence.

The problem of tonic esotropia will not be considered, since we are now concerned with a different category. The following discussion will deal with accommodative esotropia as a pure entity, but it is clear that mixed forms of esotropia are common and that the accommodative type often complicates, or is complicated by, the others. Indeed, the excessive tonic convergence of infancy forms the background upon which hypermetropia and other sources of convergence tone interact to predispose the child to a convergent angle of the visual axes, to which anatomic factors may also contribute. The failure or inadequacy of corrective optomotor reflexes permits the deviation to become manifest.

Accommodative Vergence

Although convergence may be noted at or near the time of birth, the accommodative mechanism does not fully develop until the child is about 2 years old; however, it is sometimes evidenced before the end of the first year. With the maturation of the fovea and the ciliary structures, the near world of the child becomes of consuming interest. The eyes must accommodate to see the object of regard clearly, and they must converge to see it singly in binocular vision. The close association of accommodation and convergence is reflected in the great bond of synkinesis or quasi-reflex behavior which ties them together throughout life. It cannot be definitely stated to what extent this bond is innate or learned, but the evidence favors the view of an inherent association which, perhaps, may be modified by experience through trial and error.

Let us consider practical aspects of the accommodation-convergence relationship. Nagel introduced the concept of the meter angle to define the vergence angle of the two eyes for any particular distance of an object of regard (fig. 2). In essence, one meter angle is the angle between the visual axes when a person binocularly fixes an object situated in the midline at a distance of one meter. It is clear that the numerical value of a meter angle in degrees or diopters depends on the distance between the centers of rotation of the two eyes, i.e., on the interpupillary distance, as well as on the distance of the object of regard. The infant with his narrow interpupillary distance

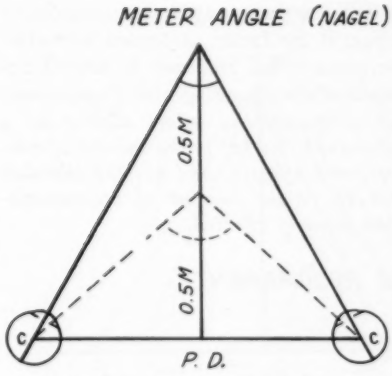


FIG. 2—Meter angle as conceived by Nagel.

has to converge his eyes less than the adult with his wide interpupillary distance when fixating an object at one meter's distance, yet both infant and adult converge one meter angle (fig. 3).

The defect of the meter-angle concept lies in the fact that it obscures the necessity for and the importance of evaluating the actual angle of convergence required for binocular fixation. The important clinical measurement of the interpupillary distance is essential to determine the required angular convergence in prism diopters. Furthermore, the angle of convergence exists between two eyes, so it is more meaningful to speak of the two eyes having a convergence of one meter angle rather than of each eye converging one meter angle, as is often stated. This has been emphasized by the American Committee on Optics and Visual Physiology, sponsored by the Academy, the American Ophthalmological Society, the Association for Research in Ophthalmology, and the Section on Ophthalmology of the American Medical Association. The actual angle of convergence in prism diopters may be easily derived by multiplying the interpupillary distance in centimeters by the dioptric distance of the object of regard. An emmetropic subject with an interpupillary distance of 6 cm. must converge 6 prism diopters to fixate an object binocularly at a distance of one meter (fig. 4). This is a simple geometric relationship, since a prism with a power of one diopter deviates the rays of light 1 cm. at a distance of one

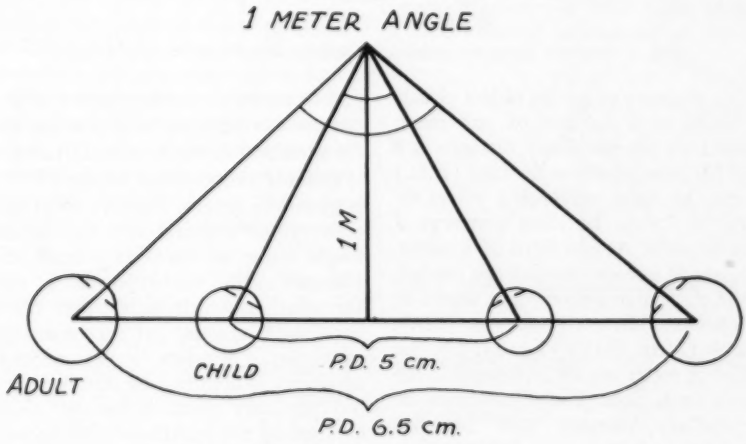


FIG. 3—Meter angle, showing significance of interpupillary distance in the convergence of the infant and of the adult.

meter. Each eye must turn 3 diopters, or 3 cm., to see the object singly (6 cm. × 1). At one third of a meter, 18 diopters of convergence is needed (6 cm. × 3).

So far, we have considered convergence alone, but the subject must also accommodate in order to see clearly. Hence, the emmetropic individual accommodates one diopter and must converge 6 prism diopters to see an object clearly and singly at a distance of one meter provided his interpupillary distance is 6 cm. If his interpupillary distance (P.D.) is 5 cm., he must converge 5 prism diopters; if 7 cm., he must converge 7 prism diopters. At one third of a meter, 3 diopters of accommodation are needed, and the respective convergence would be 18△ (6 cm. P.D.), 15△ (5 cm. P.D.), and 21△ (7 cm. P.D.) (fig. 5). Yet the number of meter angles converged is the same in each case. The significance of interpupillary distance now becomes clearer.

Furthermore, the nature of accommodation must be taken into account. It has long been known that accommodative *effort* is the factor associated with convergence — the resultant is termed accommodative convergence. *The amount of accommodative effort elicited by a stimulus is the key to the amount of convergence effected, and not the stimulus per se, or the amount of accommodation actually effected.*

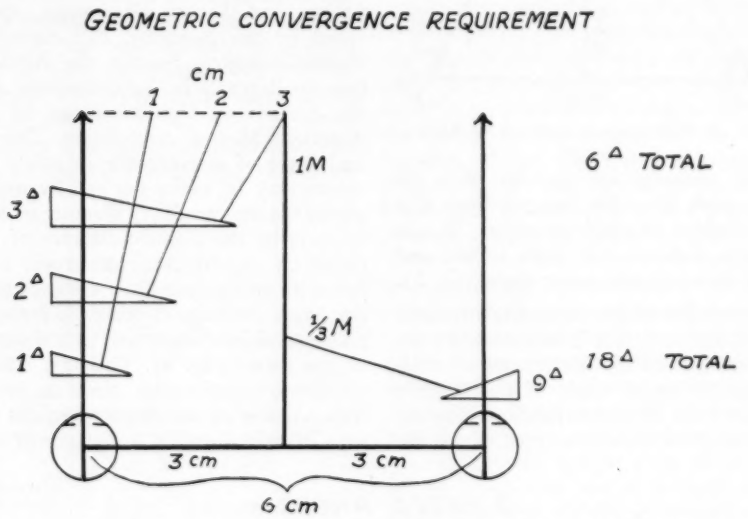
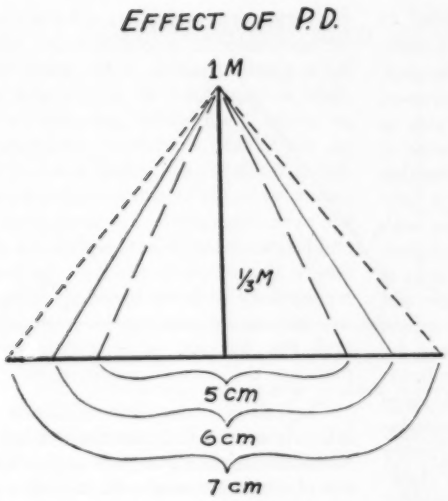


FIG. 4—Geometric layout for prismatic convergence at one and one-third meters.

Accommodative convergence will occur even though fusion is disrupted and the proximal factor removed. Its amount is roughly proportional to the effort but is generally several diopters short of the convergence requirement for binocular single vision, as has been pointed out by Morgan. Hill has reported a useful formulation which states that the approximate amount of accommodative convergence in prism diopters elicited by an object is obtained by multiplying the interpupillary distance by the dioptric measure of the accommodation necessary for the given distance of the object. We have seen that an emmetropic subject with an interpupillary distance of 6 cm.



REQUIRED CONVERGENCE

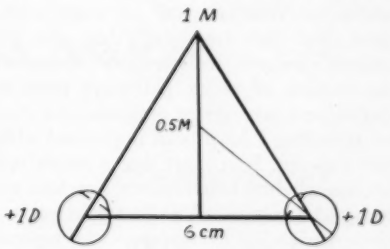
P.D.	1 M	1/3 M
5 cm	5 Δ	15 Δ
6 cm	6 Δ	18 Δ
7 cm	7 Δ	21 Δ

FIG. 5—Effect on convergence of interpupillary distances of 5, 6, and 7 cm.

accommodates one diopter and converges approximately 6 prism diopters at one meter. He accommodates 3 diopters and converges approximately 18 prism diopters at one third of a meter. An individual with a hypermetropia of one diopter, however, must accommodate 2 diopters, and hence would converge about 12 prism diopters at one meter (6 cm. × 2Δ) (P.D. × accommodation for the distance); he accommodates 4 diopters and converges about 24 prism diopters at one third of a meter (6 cm. × 4Δ) (fig. 6). *The hypermetropic subject then will overconverge for a given distance, but through the corrective fusional reflex he may retain binocular single vision.* He thus exhibits esophoria. If the fusional reflex is inadequate, he manifests an esotropia.

The relationship of accommodation to convergence has also been expressed by Morgan as the accommodative convergence-accommodation ratio (AC/A), i.e., the dioptric convergence effected by each focal diopter of accommodation. His studies indicated this to be a consistent, reproducible quantity inherent in a given individual, although considerable variability has been reported by others.

The term A/C ratio, whether expressed in meter angles or diopters, has gained vogue and should be examined. Are we justified in speaking of an accommodation-convergence ratio, normal or otherwise? If increments of conver-



HYPEROPIC SUBJECT	1 D 1M	P.D. 6 cm 1/3 M
ACCOMMODATES	2 D	4 D
CONVERGES	12 Δ	24 Δ

FIG. 6—Accommodation-convergence coordinate of hypermetropic subject at one meter and at one-third meter.

gence can be mathematically related to increments of accommodation in a more or less consistent and reproducible way, the so-called A/C ratio (better expressed as AC/A ratio) should be acceptable in defining this relationship, otherwise it should be discarded. It is debatable whether such consistency occurs. A normal ratio is said to be present when, with corrected refraction, the dissociated position (or strabismic angle) of the eyes is approximately the same for distance and for near, and an abnormal ratio exists when the deviation differs at near by more than a few diopters. Most individuals show the former relation. A large number of subjects with accommodative esotropia, however, exhibit a greater deviation at near, and of these a significant number have little or no hypermetropia. The etiology of the latter groups is obscure and requires much more study, but it may be illuminated by the following observations. Costenbader has stated that he often finds the near point of accommodation remote, suggesting a sluggish accommodative mechanism, thus necessitating excessive accommodative effort. He has commented on the notably hyperkinetic nature of children with this type of dysfunction. Tait has also pointed out the characteristic unstable nervous control of such children and has suggested that loss of central synaptic resistance or abnormal facilitation of reflex pathways permits excessive convergence response to a given stimulus. I have been impressed with this concept. It is clear that a sensitized accommodation-convergence mechanism cannot be expressed properly in ratios, since variability of response is a typical finding. Although there is an accommodation-convergence relationship, there is not necessarily a ratio. Swan has pointed out several additional factors which may lead to a greater deviation at near. Of particular interest is his exposition of the role of the interpupillary distance of the developing child in relation to his convergence requirement. If the amount of accommodative convergence elicited by a given stimulus is the same in the child as that which he will exhibit when an adult, it will prove excessive because of the child's narrower interpupillary distance. The convergence becomes more excessive as the stimulus is placed nearer the eyes. Because of his short arms, the child views most objects within the range where this effect is marked. As the interpupillary distance broadens with age, the excess of convergence diminishes and the amount of convergence approaches the normal requirement.

Correction of the near refraction with bifocals or the disburdening of cortical accommodation through substitution of peripheral accommodation with diisopropyl fluorophosphate often removes or reduces the excessive convergence response.

Fusional Vergence

We have noted that accommodation elicits a certain amount of convergence; but is sufficient convergence elicited to permit binocular fixation of the object of regard? In general there is not, and additional convergence must be exerted if exophoria or exotropia is present (fig. 7). Less convergence is required in the case of esophoria or esotropia (fig. 8). It is the task of fusional vergence to take up the slack of the fusion-free position and to bring the eyes into exact alignment on the object of regard. The stimulus to fusional vergence is retinal disparity of images. Accommodative vergence thus provides the coarse adjustment, and fusional vergence the fine adjustment, of the binocular mechanism. In orthophoria no demand is placed upon fusional vergence, although it is present in reserve. In accommodative esotropia the eyes are in an overconvergent position in response to the excess of accommodative convergence. The corrective fusional movement is one of *divergence*, an active

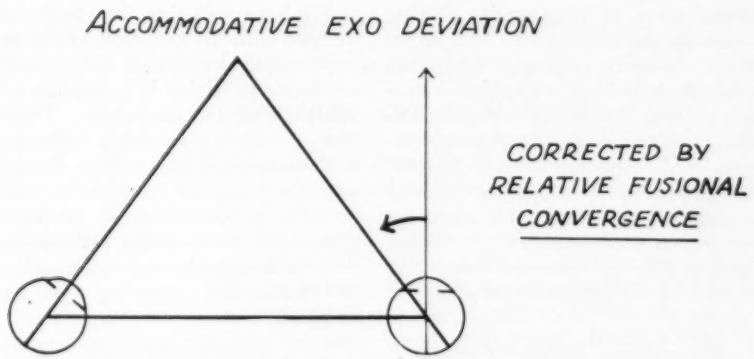


FIG. 7—Accommodative convergence in deficit (exotropia): relative fusional convergence.

and opposite movement to restore binocular single vision. This is termed *relative fusional divergence,* and it is the key to modern therapy of accommodative esotropia. It is the presence and amplitude of relative fusional divergence which determines whether a given case of accommodative esotropia can be restored to binocular single vision, i.e., to esophoria or orthophoria. It may be determined clinically in several ways.

1. The relative fusional divergence may be determined *indirectly* (Parks and Costenbader)—but most practically —by finding the weakest plus-lens correction which will permit clear, binocular single vision, i.e., which will convert esotropia to esophoria. The esophoria with this correction represents the maximum deviation that falls within the amplitude of fusion. The fusional divergence is now just able to overcome the esophoria induced by accommodation. By successively adding plus lenses, one may convert the esophoria to orthophoria, exophoria, or even exotropia. By presenting stronger and stronger minus lenses to a patient with orthophoria, one may induce accommodative esophoria, or even esotropia. Thus, we may produce

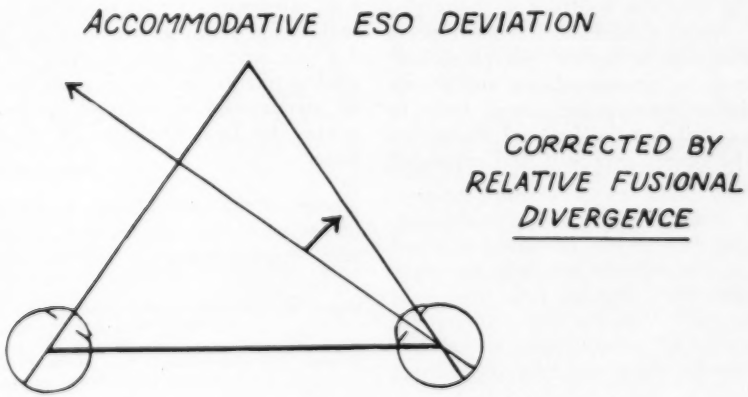


FIG. 8—Accommodative convergence in excess (esotropia): relative fusional divergence.

different states of vergence by altering accommodation with lenses. The amplitude of fusional vergence determines whether the individual is manifestly strabismic or not. The subject with accommodative esotropia lacks sufficient relative fusional divergence to retain binocular single vision. It is then the task of the ophthalmologist to provide a lenticular correction which brings the deviation securely within the available amplitude, or to develop an amplitude sufficient for the need.

2. The relative fusional divergence may be found *directly* by the base-in–blur test (Hill and Swan). The addition of base-in prisms while the eye being tested fixates a fine symbol at one third of a meter forces the subject to expend his relative fusional divergence. The point at which the symbol blurs indicates the limit of this ability, as the subject must now lessen his accommodative convergence by a decrease in accommodative effort. A normal young adult will generally have a base-in blur point greater than 12 prism diopters. After the blur point, diplopia will usually occur with slightly more base-in prism.

3. Another direct method for determining the relative fusional divergence involves the use of a haploscope.

The available evidence suggests that the intrinsic accommodation-convergence relationship is beyond the physician's control, i.e., accommodation and accommodative convergence cannot truly be dissociated, but the fusional mechanism can be taught, exercised, and expanded.

We have seen that the esophoria developed with the strongest minus or the weakest plus lens which will permit binocular single vision is a measure of the relative fusional divergence. There is, then, a certain equivalence between lens power and fusional ability—from this stem the respective roles of the ophthalmologist in controlling the accommodation so that the deviation falls within the fusional amplitude, and of the orthoptist in training and expanding the fusional amplitude.

Much remains to be learned of the interplay of accommodation and convergence. The elasticity between them, expressed in the term *relative*, may be more apparent than real, for some studies have shown that, in an absolute sense, any change of one induces a change in the other. Others, however, have pointed out that a relative fusional vergence truly exists; that is, the vergence may be altered within considerable limits without a significant change in accommodation, but a relative accommodation does not occur, for any change of accommodation elicits a significant change of vergence. Therefore, a flexible relation exists in the former, and a fixed relation in the latter.

Awareness of these viewpoints, plus a knowledge of the roles played by lenses and fusion training, provides the basis for our present understanding of the clinical picture and the modern therapy of accommodative esotropia to be described by Dr. Swan and Dr. Costenbader.

Symposium: Accommodative Esotropia

* * *

CLASSIFICATION AND DIAGNOSIS

KENNETH C. SWAN, M.D.
PORTLAND, OREGON

DR. BREININ has presented the most widely accepted concepts of the normal relationships between accommodation and the vergence mechanisms. He has pointed out how these relationships may be altered in accommodative esotropia. It is my purpose to describe the clinical features and course of this type of anomaly.

In the 1952 Symposium on Strabismus, heterotropia was defined as a manifest deviation of the visual axes.[1] The term "basic deviation" refers to that amount of deviation which is present when the patient is fixating a distant object with one eye, with his refractive error corrected and with the stimulus to binocular vision disrupted. There is no basic deviation which is typical of early uncomplicated accommodative esotropia. Instead, there is only an abnormal degree of convergence induced by excessive accommodative effort. This excessive convergence becomes manifest as an esotropia whenever the patient's fusional divergence is inadequate to overcome the induced deviation. To appreciate how accommodative esotropia may develop in a 2-year-old child it is essential to review some of the predisposing circumstances.

A 2-year-old child is just beginning really to concentrate his attention on specific objects. If he has three to four diopters of uncorrected hypermetropia, he has to accommodate more than average in order to see objects clearly. Esophoria is induced by this excessive accommodative effort. It will be greater in near than in distant vision for several reasons. For example, because the child's interpupillary distance is only about 5 cm., his convergence requirements for any given fixation distance are less than they will be as an adult. As a result, an excess of accommodative convergence is more likely to cause esophoria. Also, because his arms are short, the young child must hold objects at a distance from his eyes about half as great as that which will be possible when he is an adult. This means that, even without hypermetropia, he uses at least 6 to 8 diopters of accommodation in near vision. Contraction of his pupil provides some depth of focus, but with 3 to 4 diopters of uncorrected hypermetropia also to be overcome, he has to use most of his accommodation for clear near vision. A large amount of accommodative convergence will be stimulated, with resultant marked esophoria for near.

As pointed out by Dr. Breinin, esophoria induced by accommodative effort must be overcome by relative fusional divergence; otherwise, the child has the choice between clear vision with esotropia and blurred vision with normal alignment. Fusional divergence may not have been well enough established by the time the child is 2 or 3 years old to overcome a large amount of esophoria for near or even the lesser amount for

From the Department of Ophthalmology, University of Oregon Medical School, Portland.

Presented at the Sixty-First Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 14-19, 1956, Chicago.

distance. Furthermore, if the induced esophoria is of considerable magnitude, even the stimulus to corrective fusional movements is lessened. It has been established that the stimulus to fuse widely separated double images is less than that to fuse slightly separated double images. Also, the farther the second image is from the fovea of the deviating eye, the less clear it becomes and the better it is tolerated. If the esophoria reaches about 20 prism diopters, another factor enters to reduce the stimulus to the divergence fusional movement; objects visualized by the macular region of the fixating eye then are imaged on the blindspot of the deviating eye.[5] When this occurs, diplopia in the central field is negligible and the stimulus to fusional movements is largely eliminated. A deviation induced by accommodative effort, therefore, is likely to become manifest when it reaches 20 prism diopters.

When the above factors predisposing to the development of accommodative esotropia in early childhood are considered, it seems strange that more children do not develop such esotropia, because hypermetropia is common. It is apparent that uncorrected hypermetropia predisposes to accommodative esotropia and that other factors probably precipitate it. For example, it is known that impaired vision, general disability, or any other factor reducing fusional divergence abilities frequently precipitates an accommodative esotropia in the presence of uncorrected hypermetropia.

A typical history of accommodative esotropia is that of a deviation first becoming manifest when the child is about 2 years of age or slightly older. It may appear as early as his eighteenth month, or as late as his fifth year. Often other members of the family have had this anomaly. At first the parents note the deviation only when the child looks at a near object or when he is tired or acutely ill. Occasionally, the deviation suddenly becomes manifest and persists, but typically it disappears when the child is daydreaming or is not accurately fixating an object.

Then over a period of weeks or months the deviation tends to become persistent for both distance and near fixation. At this stage the magnitude of the deviation is usually variable, but it is seldom as great as in esotropia of the congenital type. The most commonly reported range is from 20 to 30 prism diopters. In a consecutive series of 50 untreated patients admitted at the University of Oregon Medical School, whose eyes were measured with the prism-and-cover test, 41 patients had deviations of 18 to 26 prism diopters for distance fixation.

Hypermetropia of more than the average amount is the most typical finding associated with accommodative esotropia. As long as it remains uncorrected, the deviation is characteristically greater in near than in distance vision.

In a series of patients with accommodative esotropia, the average amount of hypermetropia present will be greater than that in a comparable group of children with normal binocular single vision. Also, it is a matter of record that anisometropia and astigmatism of high magnitude are more frequent. This is not to imply that every case of accommodative esotropia has a large refractive error. In fact, children with hypermetropia of 7 or more diopters may not develop accommodative esotropia simply because they may make no effort to overcome the hypermetropia by accommodation. In patients observed at the University of Oregon Medical School, the spherical equivalent most often has been in the range from 3 to 6 diopters of hypermetropia.

There are no abnormal sensory findings which are typical of accommodative esotropia; however, amblyopia is more frequent than in most other types of

strabismus. One explanation may be that patients with accommodative esotropia generally fixate with one eye in all fields of gaze. Another possibility is that impaired vision may precipitate esotropia in the presence of uncorrected hypermetropia. A lower level of visual acuity in the deviating eye has variously been reported to occur in 4 to 15 per cent of cases, but a marked amblyopia with variable or eccentric fixation is rare. Corrected visual acuity, if amblyopia is present, usually is about 20/200 before occlusion therapy is started. Deep suppression is infrequent. Anomalous retinal correspondence is uncommon but may be found in neglected cases of early onset. Normal retinal correspondence is to be expected in most cases because the onset of the esotropia is relatively late and the deviation is so variable that the adaptive mechanism has little opportunity to develop.

I have described the general features of accommodative esotropia, but it is important to divide into subgroups those cases in which course and treatment differ. One major group consists of cases in which uncorrected hypermetropia seems the major factor causing the excessive accommodative convergence. These cases were designated as "typical" accommodative esotropia by the 1952 Strabismus Panel.[1] They also have been designated as "pure" accommodative esotropia, as "refractional" esotropia, and as cases of convergence excess due to hypermetropia. In these patients the degree of hypermetropia is moderate or large; that is, the spherical equivalent generally is 3 diopters or more. If correcting lenses are worn by the patient early in the course of malfunction, the manifest deviation is eliminated. With spectacles, a normal relationship between accommodation and convergence is present. A normal type of binocular single vision develops and becomes increasingly stable as it is maintained for distance and near fixation. These children learn to keep their eyes properly aligned by not accommodating when they take off their glasses; they then have blurred but single vision (fig. 1).

FIG. 1—Typical accommodative esotropia in a 14-year-old girl. Deviation manifest at age 3. Hypermetropia of six diopters corrected at age 4. (Top) With glasses she has a normal type of binocular vision. (Center) Without glasses and with accommodation relaxed, she has normal alignment and blurred single vision. (Bottom) With the accommodation required for normal visual acuity, patient has marked esotropia and is aware of diplopia.

Delay in the prescribing of lenses may so establish an accommodative esotropia that it may not be completely eliminated by spectacles. A residual esotropia for near, with glasses, is a common finding in neglected cases, but the deviation is not large in typical cases. In other ne-

glected cases, abnormal mechanisms such as suppression and amblyopia may have become so well developed that it is difficult to establish a normal type of binocular vision, even if glasses effectively reduce the deviation.

There is a second group of patients with accommodative esotropia in whom uncorrected hypermetropia does not seem to be the only factor causing excessive accommodative effort. In fact, the hypermetropia generally is of less magnitude than in typical accommodative esotropia. Correction of hypermetropia, if present, largely eliminates the distance deviation, but excessive convergence persists in near vision, at least through early childhood (fig. 2). It can be shown that the residual overconvergence in near vision is of accommodative origin, because it is greatly reduced or eliminated by a reading addition or by use of anticholinesterase drugs. This group of patients differs from typical patients in other respects. In a group studied at the University of Oregon Medical School, the incidence of amblyopia, anomalous correspondence, and suppression was much higher than that in the typical group. In general, these cases are recognized as a separate subgroup of accommodative esotropia. They have received various designations, but accommodative esotropia with residual esotropia for near vision describes them most accurately. There is a dispute as to the causative factors.

In most cases of accommodative esotropia with residual overconvergence in near vision, growth plays an important role. Typically, this overconvergence in near vision decreases markedly or disappears by the time the patient is 15 or 16 years old. The role of growth has not been determined with certainty, but studies conducted at the University of Oregon Medical School during the last five to six years indicate that two factors are important—increasing interpupillary width and shift of refractive error toward myopia. Hill[3] has pointed out that as a child's interpupillary distance widens, his convergence requirements increase as much as 6 to 8 prism diopters (fig. 3). Also, a shift in refractive error toward myopia is usual. It is possible that an accommodation-convergence relation which will become perfect for the patient as an adult, could result in excessive convergence in near vision when he is a young child.

FIG. 2—Atypical accommodative esotropia. Child 7 years old, with 1.5 diopters of hypermetropia. (Left) Staring into the distance she has esophoria of 5 to 6 prism diopters. Glasses eliminate this deviation. (Right) When the patient fixates an object at 25 cm., a marked esotropia develops. It is eliminated by plus five spheres.

It will take years to establish with certainty the role of these growth factors, and there are other possible causes for the residual esotropia for near in some cases of accommodative esotropia. One of these, first pointed out by Cos-

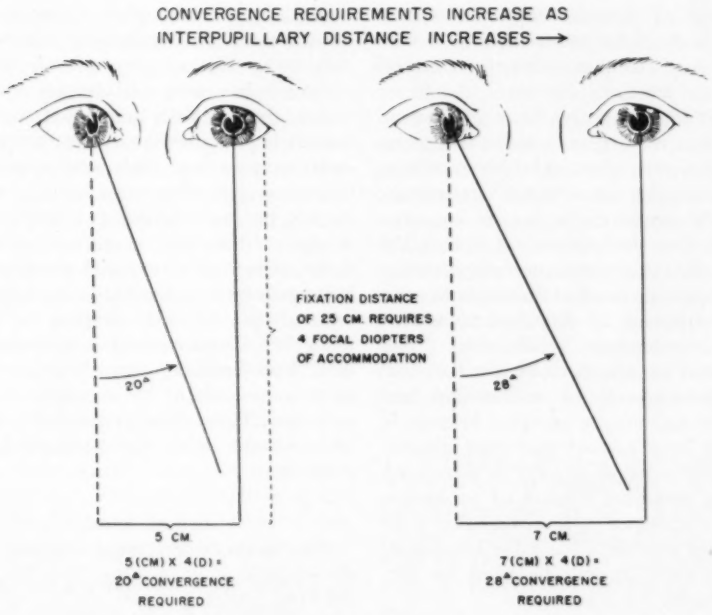


FIGURE 3.

tenbader,[2] is reduced accommodative ability. A child with paresis of accommodation would of necessity have to use excessive accommodative effort.

Another explanation considered by this panel is that at least some of these patients with residual overconvergence in near vision have a latent hypermetropia which cannot be brought out by the first cycloplegic refraction because of anatomic adaptations of the ciliary muscle to the hypermetropia. The evidence presented in support of this concept is that in many young children it is a common experience to find only 2 or 3 diopters of hypermetropia with the first atropine cycloplegia. After a child has worn lenses several months, cycloplegic recheck reveals one or more diopters of uncorrected hypermetropia. Whether such findings indicate a marked latent hypermetropia or merely an alteration due to growth is difficult to determine. Slataper[4] has found that hypermetropia generally increases more than 1.5 diopters when the child is between the ages of 2 and 5 years. The panel agrees that increasing hypermetropia may be found until the child has reached the age of 7.

A fourth possibility, difficult to prove or disprove, is that these children overaccommodate for near vision, and thereby stimulate excessive accommodative convergence. As much as 2 diopters of overaccommodation supposedly are compensated for by the depth of focus of the eye and acceptance of a slightly blurred image. In support of this concept is the occasional observation made during dynamic retinoscopy that many young children are relatively myopic in near vision, whereas adults typically use the minimal accommodative effort needed for clear near vision.

It is evident that additional investigation is needed to establish the cause of

this type of accommodative esotropia, which is characterized by a large deviation in near vision even when correcting lenses are worn. In any event, the panel agrees that these cases have a different course and require more active treatment than do typical cases in which excessive accommodative convergence is eliminated when single vision lenses are prescribed. For the purpose of discussing treatment, Dr. Costenbader will describe the group with residual esotropia in near vision as having an abnormal accommodation-convergence relationship. The concept of an inherent, abnormal accommodation-convergence relationship has not been universally accepted because it has not been proved that each diopter of accommodation actually is associated with an abnormal amount of accommodative convergence; however, this concept does provide a basis for treatment, and as such, it will be used by Dr. Costenbader.

I have described two major types of accommodative esotropia: the typical type and the type with residual esotropia for near.

A small, but separate, group of patients with an accommodative type of esotropia are those children with hypermetropia in one eye and a sensory obstruction to normal binocular vision, such as unilateral cataract or a very large refractive error, in the other eye. If such a child has considerable uncorrected hypermetropia in his fixating eye, the extra accommodative effort necessary for clear vision results in excessive adduction of the eye with poor vision. As in typical accommodative esotropia, the deviation is greater in near vision than it is in distance vision. The deviation for distance is largely eliminated by correcting lenses, but some convergence may persist in near vision until adolescence. By then, the overconvergence may be superseded by underconvergence.

Finally, there is a large group of patients with a mixed accommodative and nonaccommodative esotropia. Untreated patients in this category have an esotropia which increases considerably in near vision, that is, with accommodative effort. It is possible that some of these patients may have started with an accommodative type of esotropia which, with neglect, became a constant esotropia; but in many others the excessive accommodative effort associated with uncorrected hypermetropia is merely superimposed on esotropia of other origins. In fact, uncorrected hypermetropia undoubtedly is a "back-breaking straw," which converts some cases of basic esophoria into esotropia. These patients are said to have an esotropia with an accommodative component.

CLINICAL TYPES
OF ACCOMMODATIVE ESOTROPIA

1. *Typical Accommodative Esotropia*
   Deviation is due, primarily, to uncorrected hypermetropic refractive error. Normal accommodation-convergence relationship is restored by glasses.

2. *Atypical Type of Accommodative Esotropia with Residual Overconvergence in Near Vision*
   The average refractive error is less than that in typical cases. Single vision glasses do not restore normal accommodation-convergence relationship.

3. *Accommodative Type of Esotropia Due to Uncorrected Hypermetropia in One Eye, and Sensory Obstacles of Fusion, e.g., Impaired Vision, in the Other*

4. *Mixed Accommodative and Nonaccommodative Types*
   a. Basic esotropia with an accommodative component
   b. Neglected accommodative esotropia with sensory and motor adaptive mechanisms

Untreated, all types of accommodative esotropia generally develop into a persistent esotropia. In fact, after the deviation has persisted for many months or years, correcting lenses often do not completely eliminate even the distance deviation. In general, the course of untreated typical accommodative esotropia is not favorable, but there are occasional reports of spontaneous cures. This might be expected, because with the patient's growth from infancy to adolescence, the deviation tends to decrease, particularly for near vision. This is not entirely due to orbital changes. After the child reaches the age of 7, hypermetropia usually decreases so that excessive accommodative convergence from this cause is lessened. Then the child uses progressively less accommodation as his arms lengthen and he holds objects farther from his face. As a child, his usual near range requires 6 to 7 diopters of accommodation, but as a young adult he uses only 3 to 4 diopters. Finally, his interpupillary distance widens, and his convergence requirements for near vision may so increase that as much as 5 or 6 prism diopters of the excessive accommodative convergence are absorbed (fig. 3). As a result of these factors, some patients who have had accommodative esotropia in infancy actually develop exotropia by the time they reach adolescence. The first manifestation is a remote near point of convergence when the hypermetropia is fully corrected.

The spontaneous development of exotropia following esotropia generally is designated as consecutive exotropia. Exotropia is prone to develop in those patients with accommodative esotropia who do not develop a normal type of binocular single vision in early childhood. There are two groups which seem particularly predisposed, because they do not develop an adequate amplitude of fusional vergences to permit stable binocular vision. The first group includes patients with intractable unilateral amblyopia, marked anisometropia, or poor vision, of any origin, in one eye. The second group consists of children with 6 or more diopters of hypermetropia. Even with correction, this group generally has a limited amplitude of fusional movements. Later, Dr. Costenbader will emphasize the fact that surgical intervention is hazardous for these two groups of patients.

[The clinical types of accommodative esotropia were demonstrated in a motion picture produced at the University of Oregon Medical School by Dr. Swan with the help of two associates, Dr. Peter P. Rowell and Dr. Paul F. Bailey, Jr.]

REFERENCES

1. Adler, Francis Heed: The pathologic physiology of the horizontal deviations. In Symposium: Strabismus, Tr. Am. Acad. Ophth., 57:145-156 (March-April) 1953.
2. Costenbader, Frank D.: Clinical course and management. In Symposium: Accommodative Esotropia, Am. Orthoptic J., 4:12-16, 1954.
3. Hill, Robert V.: A simple method of determining the coordinate requirements of convergence, Am. Orthoptic J., 5:105-108, 1955.
4. Slataper, F. J.: Age norms of refraction and vision, Arch. Ophth., 43:466-481 (March) 1950.
5. Swan, Kenneth C.: The blindspot mechanism in strabismus, Am. J. Ophth., 38: 765-777 (Dec.) 1954.

PRINCIPLES OF TREATMENT

FRANK D. COSTENBADER, M.D.
WASHINGTON, D. C.

As pointed out by Dr. Swan and Dr. Breinin, the various clinical aspects of accommodative esotropia must be recognized and the probable physiologic background understood. Only then may treatment be intelligently undertaken.

Since in accommodative esotropia the onset of the deviation is relatively late (usually after the child is two years old), amblyopia and suppression are not deep-seated unless anisometropia or organic interruption of vision is present. Further, the deviation usually is intermittent at first, but it may rapidly become constant (at times, irreversibly). Therefore, early treatment is urgent in order to maintain the opportunity for fusion and to prevent the secondary neuromuscular changes which cause constant deviation.

The treatment of accommodative esotropia consists of reinstatement of binocular alignment and binocular vision by the immediate use of spectacles, bifocals, miotics, and/or surgical intervention, and a continuing effort to maintain this alignment. If treatment has been delayed or anisometropia is present, the resultant amblyopia and suppression must be treated by occlusion and active visual stimulation. If *constant* deviation has supervened, and spectacles and miotics are not effective, an operation may be resorted to. When satisfactory binocular alignment has been gained and when the child is of an age to cooperate, orthoptics to improve fusion and fusional amplitudes (especially relative fusional divergence) is helpful. And, finally, when fusion becomes increasingly secure and the need for spectacles less, the lenses may be reduced in strength or the use of spectacles eliminated. Thus, the pattern of treatment is evident.

These principles and methods must, however, be applied more specifically to be fully understood.

Regaining and Maintaining Visual Acuity

From the early infancy of a child, some estimate of his visual acuity may be gained by determining his ability to fixate centrally and to maintain fixation in each eye. From the time he is 3 or 4 years old until he is 6, the Snellen illiterate "E" chart will give a more accurate estimate of visual acuity. After the age of 6 years, the regular Snellen chart should be used.

In the presence of amblyopia, complete occlusion of the preferred eye should be carried out. In older children this may be combined with games and other tasks requiring good vision. Recent work by François and James shows that visual stimulation combined with occlusion may shorten the time of treatment to as little as one third of the time required by occlusion alone. Emphasis must be placed on good visual acuity

From the Departments of Ophthalmology, Episcopal Eye, Ear and Throat Hospital and Children's Hospital, Washington, D. C.

Presented at the Sixty-First Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 14-19, 1956, Chicago.

while viewing the *full* chart rather than isolated symbols, and on being able to *maintain* accurate foveal fixation, in order to allow the best development of foveal fusion. However, rather secure binocular vision does occur at times, even in the presence of marked foveal suppression; therefore, fusion must not be despaired of unless amblyopia is severe or central fixation very insecure. Peripheral fusion is an important stabilizer.

Anisometropia or organic damage involving the visual mechanism makes the gaining and maintaining of good visual acuity difficult in direct proportion to the degree of anisometropia or damage present. It is not unusual to note that patients with anisometropia may gain a most satisfactory visual acuity on intensive therapy, only to have it deteriorate to 20/70 or 20/200 soon after treatment is stopped. The prognosis for maintaining good vision in such cases is poor and prolonged treatment is not warranted after the patient has reached the age of 7 or 8 years.

Regaining and Maintaining Binocular Alignment

While efforts are being made to improve visual acuity, binocular malalignment should be actively treated. This treatment may consist of unifocal or bifocal spectacles, miotics, surgical intervention, or combinations of these.

As pointed out by Dr. Swan, accommodative esotropia is roughly divided into two classes. One has been designated variously as "typical" or "refractional" accommodative esotropia, or accommodative esotropia with a normal A/C ratio or relationship. In this type, hyperopia is moderately high (2.00 to 5.00 diopters), and the wearing of the full correction eliminates the manifest deviation for 20 feet and for 13 inches. The other has been variously called "spasm of convergence," "convergence excess," "atypical accommodative esotropia," characterized by a small hyperopia and an esotropia disproportionately large at 13 inches as compared with that at 20 feet. The treatment of each differs sufficiently from that of the other to warrant separate discussion of the two.

1. *Accommodative esotropia with a normal A/C relationship*

The primary cause of this esotropia for 20 feet and for 13 inches is the accommodative effort required to obtain good vision in the presence of an excessive hyperopia. Excessive convergence results if convergence is not properly controlled by the relative fusional divergence and/or the correction of the refractive error. Treatment consists in prescription of spectacles of a strength sufficient to relieve accommodation and excessive convergence, and institution of orthoptic training to improve relative fusional divergence. In children under the age of 5 years, a full hyperopic correction should be prescribed. Indeed, the hyperopia may be overcorrected one half to one diopter in children 2 to 4 years of age because of possible latent hyperopia and the tendency for hyperopia to increase in the early years of life. In children over the age of 5 years, the amount of the hyperopia to be corrected may be determined by the method herein described.

If, perchance, the esotropia for 20 feet is totally eliminated but some residual esotropia continues for 13 inches, miotics or a bifocal segment in the lens may be helpful, as will be described. It is important that accurate binocular alignment and the opportunity for binocular single vision shall be present as much of the time as possible during the early habit-forming years.

If treatment has been delayed, or if, for other causes, a residual esotropia (a so-called combined accommodative and

nonaccommodative esotropia) persists for both 20 feet and for 13 inches after the child has worn full hyperopic correction, an operation to correct *only* the nonaccommodative element should be done, as soon as findings are definite. If spectacles eliminate the deviations for 20 feet and for 13 inches, surgical intervention is unwise and would probably produce exotropia.

2. *Accommodative esotropia with an abnormal A/C relationship*

The primary cause of this condition is not understood. Since the strabismus is characterized by a disproportionately large esotropia at 13 inches (even with full hyperopic error neutralized by glasses), every effort should be made to eliminate accommodative effort for 13 inches by the use of bifocals or miotics, or both. At times an operation may be indicated. The bifocals optically eliminate accommodation. Miotics (e.g., Floropryl®) seem to normalize the convergence response to accommodation. Surgical intervention reduces the efficiency of muscle action, and this minimizes the convergence resulting from a given amount of accommodative effort.

Both the esotropia for 20 feet and the hyperopia are small. The correction of the refractive error eliminates the deviation at distance, but in most cases there is a large residual esotropia at 13 inches which *may not be apparent when the patient fixates on a muscle light but is readily apparent if he is encouraged to view a small picture or symbol at 13 inches.* Usually this deviation at 13 inches is eliminated or greatly minimized by the addition of a + 3.00 sphere. When this is true, the correction should be prescribed in the form of a large (38 mm.) Ultex A type of bifocal with the top of the segment placed level with the midpupil to minimize peeping over. Children of any age adjust to bifocals readily. At times, an addition up to a + 3.50 sph. "add" is wise because of the habitually short fixation distance in the very young and the very active convergence response.

In some cases an esotropia at 13 inches may not be fully compensated by bifocals. One drop of Floropryl®, .025 per cent, in each eye, daily, may further relieve accommodative effort, thus eliminating the residual esotropia and allowing bifoveal fixation at 13 inches as well as at 20 feet. At times, in children one to 3 years of age who have a hyperopia of one diopter or less but a manifest esotropia at 13 inches, Floropryl® may eliminate the deviation for 20 feet and for 13 inches, delaying the necessity for spectacles. This is usually a temporary but satisfying expedient for periods of several months to a year. Pupillary cysts do occur, but they rarely persist when administration of Floropryl® is stopped. This undesirable feature may be minimized by allowing the occasional expansion of the pupil.

Although past and present teaching has been that surgical intervention is unwise in the treatment of accommodative esotropia, current investigation suggests that a well-considered operation may be helpful in certain cases. When the "basic esophoria" at 20 feet (with full correction) builds up on alternate cover to 10 or more prism diopters, combined with a manifest esotropia at 13 inches, a small recession of both medial recti is helpful. On the other hand, if the basic esophoria is small but manifest deviation for 13 inches is present, recession of one medial rectus may be wise.

If an operation is performed to correct accommodative esotropia, great caution must be exercised. In addition, it must be recognized that the discrepancy between the deviation at 20 feet and that at 13 inches may only be minimized but not eliminated, and that bi-

focals or miotics may continue to be necessary in order to maintain bifoveal fixation. It is particularly important that parents be informed of these possibilities.

A word should be said about the "V-syndrome," a condition in which esotropia is greater when the patient looks down and less when he looks up, and it is not necessarily influenced by the distance of fixation. This condition, at times confused with accommodative esotropia with abnormal A/C relationship, is probably associated with abnormal activity of the vertically acting muscles, especially the obliques. It is primarily a surgical problem, though differences of opinion exist as to the operation of choice.

I should like to emphasize certain personal opinions about the surgery for correction of accommodative esotropia. The panel is not in full agreement on this matter.

a. When a normal A/C relationship is present—the eyes straight with the proper spectacles at 20 feet and at 13 inches—and when the basic esophoria is small, surgical intervention is contraindicated, since secondary divergence often results.

b. When an abnormal A/C relationship exists, the eyes being manifestly esotropic at 13 inches even with correction, and when conservative treatment has been thoroughly tried, surgical intervention is justified but must be performed with caution.

c. When a manifest esotropia is present for 20 feet and for 13 inches but has a superimposed accommodative component, an operation should be done to correct the basic deviation *only*—not the accommodative component.

d. When severe amblyopia or high degrees of hyperopia or hyperopic astigmatism are present, consecutive exotropia often occurs, even though no operation has been performed. Therefore, any operation should be performed with great restraint, and further restorative intervention should be anticipated if and when exotropia occurs.

Having restored visual acuity by occlusion and specific stimulation, and having regained alignment by some combination of spectacles, bifocal segments, miotics, and surgical intervention, binocular single vision has been given every opportunity to develop; and this, as early in life as possible.

When a child is sufficiently mature (often not until school age or later), orthoptic procedures may be undertaken to encourage fusion actively and to improve fusional amplitudes. If amblyopia has been abolished, suppression must be overcome by appropriate exercises on the major amblyoscope and on other stereoscopic devices, and by encouraging the awareness of diplopia.

When suppression has been eliminated and diplopia readily appreciated, improved fusion and fusional amplitudes must be encouraged, first while the child wears spectacles with the necessary correction, and later with the strength of the correction reduced or with no correction. Such exercises must encourage both fusional convergence and fusional divergence, since the total amplitude of fusional vergence is limited in most cases of strabismus. Later, especial emphasis must be placed on relative fusional divergence (the ability to diverge while maintaining single binocular vision *and seeing clearly*). This skill may be improved by practice with the many binocular instruments, such as the stereoscope, major amblyoscope, stereo-orthopter, rotoscope, and metronoscope.

As relative fusional divergence becomes more adequate, the full hyperopic correction becomes less necessary for the maintenance of comfortable binocular single vision, and the strength of lenses may be progressively reduced. There is

the reasonable hope that the person with hyperopia of less than 4 diopters may discard glasses, or use them only for reading and close work. To estimate the least hyperopic correction necessary to secure binocular single vision, the following procedure should be used:

The full cycloplegic finding is placed in a trial frame. Then, while the patient is maintaining clear 20/30 vision on the Snellen chart at 20 feet, the hyperopic correction is simultaneously reduced 0.5 diopter in each eye. Each time a reduction is made, cover-uncover is done to determine whether bifoveal fixation is being maintained. This progressive reduction in sphere is continued until the weakest correction which will allow bifoveal fixation and 20/30 vision is reached. A similar examination is done at 13 inches, beginning with full cycloplegic correction, and a + 3.00 sph. add for both eyes when necessary. The progressive reduction is made while the patient is identifying a 20/30 symbol on a near vision chart (fig. 1). Again, the weakest spherical correction allowing bifoveal fixation and 20/30 vision is the proper correction for near. If the minimal needs for 20 feet and for 13 inches differ by more than one diopter, bifocals should be ordered, incorporating the two minimal corrections.

FIG. 1—Accommodometer being used for the determination of "the minimal hyperopic correction necessary to maintain single binocular vision."

At least once in six months, and at times oftener, the "minimal correction" should be determined and the glasses reduced if the change is appreciable. Care should be taken to maintain an adequate strength of lens during spells of prolonged illness and during the winter when the eyes are being used a great deal. The progressive reduction in glasses may be aided by the use of minus fit-overs in grades of 0.5 diopter. Thus, through the improvement of fusion, and especially through an improvement in relative fusional divergence, what has been called "dissociation of accommodation and convergence" has taken place.

The treatment of accommodative esotropia has included (1) the overcoming of amblyopia and suppression by occlusion and active visual stimulation, (2) the relief of the deviation by unifocal or bifocal spectacles, miotics, and at times conservative surgical intervention, (3) the stabilization of fusion and the improvement of fusional amplitudes through spontaneous usage and orthoptics, and finally (4) the elimination of miotics and the progressive reduction of the strength of the lenses worn.

The prognosis for the cure of the strabismus is good if (1) the A/C relationship is good, (2) treatment is instituted immediately after onset of the deviation, (3) persistent follow-up is maintained, and (4) significant amblyopia or organic visual deficiency is not present.

Symposium: Accommodative Esotropia

SUMMARY AND CONCLUSIONS

KENNETH C. SWAN, M.D.
PORTLAND, OREGON

MUCH remains to be learned about accommodative and vergence relationships; however, enough facts have been established to provide the ophthalmologist with a rational basis for the management of accommodative esotropia.

The effort of accommodation invariably stimulates convergence. This is designated as accommodative convergence. Normally, accommodative convergence is roughly proportional to the amount of accommodative effort, but it usually falls short of meeting convergence requirements for near vision. Fusional convergence, stimulated by disparity of retinal images, normally corrects for this deficiency. Thus, a vergence movement stimulated by accommodative effort provides the coarse adjustment, and fusional vergence provides the fine adjustment of the visual axes for normal binocular single vision at near ranges.

In accommodative esotropia, accommodative convergence is excessive. The fusional vergence necessary to correct this overconvergence would be fusional divergence. This is an active mechanism and not merely a relaxation of convergence. It is termed relative fusional divergence because a considerable vergence movement can take place without alteration in accommodation. Relative fusional divergence can be measured directly with prisms and a fine fixation target, or indirectly by determining the weakest plus or strongest minus lens permitting binocular single vision at a given focal distance. It is the presence and adequacy of relative fusional divergence which determines whether a given patient can or cannot overcome an excessive amount of accommodative convergence. If fusional divergence is inadequate, the deviation becomes manifest as accommodative esotropia.

Accommodative esotropia typically develops in children one and one-half to five years of age. Often there is a family history of the anomaly, and usually there is more than the average amount of hypermetropia alone or associated with astigmatism or anisometropia. With the hypermetropia uncorrected, the deviation characteristically is greater in near than in distance vision and is variable in magnitude. The most common sensory anomaly associated with accommodative esotropia is amblyopia, but even it is infrequent.

In typical accommodative esotropia an uncorrected hypermetropic refractive error is the primary cause of the excessive accommodative convergence. The early prescription of single vision lenses correcting the hypermetropia greatly reduces or even eliminates excessive accommodative effort and permits establishment of a normal type of binocular single vision.

The most important subtype is found in that large group of patients who have a residual esotropia in near vision when

Presented at the Sixty-First Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 14-19, 1956, Chicago.

the refractive error is corrected. The origin of this excessive accommodative convergence in near vision is not fully established, but multiple factors are probable. For purposes of treatment, these patients are considered to retain an abnormal accommodation-convergence relationship when the patient is made emmetropic with glasses.

Uncorrected hypermetropia may add an accommodative component to esotropia of any origin. Also, it may precipitate esotropia if a sensory obstacle to vision, such as a cataract or congenital amblyopia, is present in one eye, or if the patient has a basic esophoria of any origin.

Untreated, the usual course of typical accommodative esotropia is the development of persistent esotropia of moderate degree. Furthermore, the longer the esotropia persists, the less likely is the deviation to be eliminated by the prescription of spectacles. Also, adaptive sensory and motor abnormalities may develop. A decrease in the amount of esotropia usually occurs as the child grows into adulthood; therefore, spontaneous cures occasionally occur, but they are uncommon. Two groups of patients, those with large refractive errors and those with poor vision, are prone to change from an accommodative type of esotropia in early childhood to exotropia in adolescence.

If a marked anisometropia or irreversible impairment of vision is not present, the prognosis for the cure of accommodative esotropia is good, provided adequate treatment is instituted early and is continued over a period of years. Early treatment is urgent to prevent secondary sensory and motor changes if the child is to maintain his opportunity to develop a normal type of vision. Persistent treatment is essential in order to maintain good alignment and stable fusional mechanisms during the child's developmental years.

In all cases it is essential to establish and maintain maximal visual acuity by correction of the refractive error. Amblyopia, if present, should be treated by active visual stimulation as well as by occlusion of the preferred eye. Correction of the deviation can be conducted concurrently.

In typical accommodative esotropia a normal accommodation-convergence relationship is restored by the prompt prescription of glasses, fully correcting or even overcorrecting the hypermetropia. If the prescription of glasses has been delayed, an amount of esotropia sufficient to prevent fusion may persist in distance vision. If this basic deviation is constant and other methods have been inadequate, surgical correction of only this amount of esotropia should be considered.

In some atypical cases of accommodative esotropia, an abnormal relationship persists even when a patient is made emmetropic by glasses. The excessive accommodative convergence in near vision can be treated by the prescription of bifocals or miotics, or both. As in typical cases, surgery is indicated only for a persistent and significant basic deviation. In all cases of esotropia having an accommodative component, surgery should be undertaken with great caution, since postoperative exotropia is prone to develop. Surgery should not be undertaken merely to obviate the need for glasses.

In more mature children, a diversity of orthoptic procedures can be used to develop and stabilize the fusional processes. If relative fusional divergence becomes adequate, the strength of the glasses often can be reduced to the minimal amount necessary to maintain comfortable binocular single vision. With early and persistent treatment, it is reasonable to expect that patients with less than 4 diopters of hypermetropia can develop some independence from glasses.

MALIGNANT MELANOMA IN THE TEMPORAL PERIPHERY ASSOCIATED WITH MACULAR SYMPTOMS AS AN INITIAL FINDING

WILFRED E. FRY, M.D.
P. ROBB MCDONALD, M.D.
PHILADELPHIA, PENNSYLVANIA

A MALIGNANT melanoma located in the periphery of the fundus is usually associated with a peripheral field defect varying in size according to the size and position of the tumor. At times it may be associated with a serous detachment, which produces a defect in the peripheral field in a position opposite to the defect produced by tumor. Associated with the peripheral field defect may be the subjective complaint of a visual defect similar to a curtain obstructing the vision and appearing to extend from one side, above or below. The present report is of two cases in which a malignant melanoma was located in the temporal periphery of the fundus and in which the initial subjective defects were those associated with the central vision. In both cases changes in the macular area could be seen with the ophthalmoscope. These changes in one of the cases were of such a type that three experienced ophthalmologists believed that the lesion was a central serous retinopathy. After enucleation, examination of each eye disclosed a tumor located in the region under the insertion of the external rectus muscle. Sections of one enucleated eye passed through the macular area and revealed a macular separation and edema. This separation was not connected with the serous retinal separation associated with the tumor. The subretinal fluid in the area under the macular elevation stained a deep pink, whereas the subretinal fluid about the tumor was without staining characteristics.

Since the sequence in both of these cases is important, the findings will be indicated with the corresponding dates.

Case 1: E. S., female, age 50 years.

August 21, 1955—Patient first reported for examination and complained of blurred vision in her left eye. A manifest refraction was done. The vision in the right eye was 6/9 without correction and 6/6 with correction. The vision in the left eye was 6/6 both with and without spectacles.

August 22, 1955—Fundus examination in each eye with the pupils dilated with Paredrine® showed the right eye to be free of lesions. In the left eye the media were clear and the disc was healthy. The presence of macular edema was questionable. At this time the patient complained that objects appeared to have somewhat amber color.

August 29, 1955—Cycloplegic refraction was performed. Vision in the right eye was 6/6, and in the left eye, 6/6. Results of the fundus examination were reported as negative for each eye, except for macular edema in the left eye.

September 3, 1955—Vision in each eye was 6/6. Patient still felt that the vision in the left eye was slightly blurred. Perimetric examination of central fields revealed an absolute scotoma above fixation point for 2/1000 white test object, but with no break-through of a 2/1000 isopter in the central field. The 2/1000 field was slightly reduced, but in a concentric manner (fig. 1). Peripheral field was full.

September 14, 1955—Patient complained of slightly distorted vision in the left eye, with a yellowish appearance to objects. Vision in the right eye was 6/6, and in the left eye, a possible 6/6. Fundi were examined using

From the Wills Eye Hospital, Philadelphia.

Presented at the Sixty-First Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 14-19, 1956, Chicago.

Paredrine® mydriasis. The right fundus was without lesions. The left fundus showed questionable macular edema; no peripheral changes were noted. Intraocular tension was 23 mm. Hg in the right eye and 21 mm. Hg in the left eye, Schiøtz.

September 21, 1955—Examination of fields of the right eye showed no defect. Fields of the left eye revealed a defect above and breaking into the blindspot for a 2/1000 white test object.

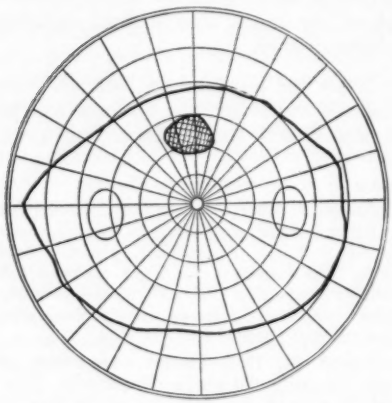


FIG. 1—Central field in case 1, showing paracentral scotoma. Test object, 2/1000 white.

October 26, 1955—Central fields in the left eye showed a defect extending into the central area. Ophthalmoscopic examination revealed macular edema and an elevated area in the temporal periphery.

November 7, 1955—Patient was admitted to the Wills Eye Hospital. Phosphorus 32 studies gave positive results. The detachment in the temporal periphery was easily seen.

November 15, 1955—Left eye was enucleated. The pathologist's diagnosis was malignant melanoma, spindle cell, subtype B.

PATHOLOGIC REPORT

Gross examination revealed the globe to be normal in size. There was a malignant melanoma, approximately 5 by 8 mm., occupying the temporal periphery beneath and slightly inferior to the insertion of the external rectus muscle. The retina over the area of the mass was adherent to the surface, but toward the posterior pole there was a serous elevation which did not extend to the macula. The retina came in contact with the underlying choroid approximately 3 mm. temporal to the macular region. Grossly it could be seen that the retina at the macular region was very slightly elevated (fig. 2).

FIG. 2—Case 1. Section of left eye, showing tumor location and retinal separation at the macular area.

Cornea: The cornea was normal in all respects. There was no evidence of infiltration or vascularization. The anterior chamber was clear, and the angles appeared open and nonobstructed.

Iris and Ciliary Body: The iris was of normal appearance with no areas of infiltration. The ciliary body had the usual contour. On the side adjacent to the tumor, the pars plana of the ciliary body was elevated by the tumor.

Retina: The retina was elevated over the tumor but was attached to it at several areas. At the posterior end of the tumor, the retina showed a serous elevation. Farther posterior to this, the retina came in apposition to the underlying choroid, but at the macular area a small but definite elevation could be noted. On the side opposite the tumor, the retina showed cystic degeneration. Other areas of the retina appeared normal. The tumor extended anteriorly beyond the position of the ora serrata. Near the tumor a pinkish subretinal exudate could be seen, but most areas of retinal separation away from the tumor revealed no subretinal exudate. A pinkish subretinal exudate was present beneath the macular separation (figs. 3 and 4). At the macu-

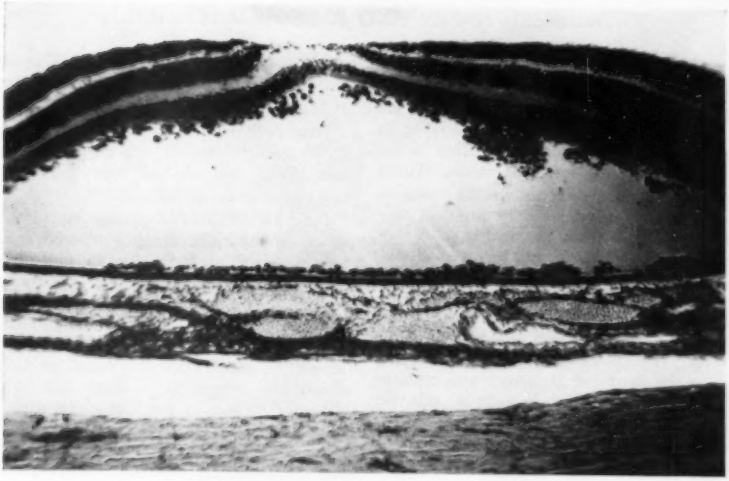


FIG. 3—Case 1. Macular area, showing separation and edema.

FIG. 4—Case 1. Macular area, showing edema.

lar area the cones could be seen, but it was not possible to determine whether there was any abnormal change in them. Small cystic areas were seen in the inner nuclear layer in the macular region. Similar cystlike areas were not seen in the adjacent retina. There was a moderate number of pigment-containing cells, similar to cells of the pigment epithelial layer, within the pinkish exudate beneath the macular area. There was a small accumulation of red blood cells beneath the internal limiting membrane just at the edge of the macular area on one side.

Choroid: The tumor was located within the choroid at the temporal periphery and consisted of a solid mass of spindle cells of subtype B. The major part of the tumor showed little pigmentation, but one very dense area of pigmentation was present near the inner central area. There was a moderate number of dilated vessels at the posterior edge of the tumor. The remainder of the choroid showed no unusual change.

Optic Nerve: The optic nerve showed no abnormal changes and no areas of infiltration.

Diagnosis: Malignant melanoma of the choroid, spindle cell, subtype B. Macular separation with cystic degeneration.

Case 2: J. W., male, age 31 years.

April 4, 1952—Chief complaint was blurred vision in the right eye for a period of five or six weeks. Questioning revealed some metamorphopsia. The fundus examination of the right eye showed edematous cystoid change. Fields charted at that time showed no central scotoma for 2/1000 white and a normal-sized field for 2/1000 isopter. Vision in the right eye was 20/50, and in the left eye, 20/30. Peripheral fields were full.

April 8, 1952—The patient was hospitalized. Examination revealed no abnormality except that a dental roentgenogram revealed an impacted third molar, which was subsequently removed. The patient was given a vasodilator and antihistaminic drugs. He was also given typhoid bacilli intravenously. He was discharged with a visual acuity of 20/30 in the right eye; subjectively he was improved. At this time he was seen by three competent ophthalmologists, who considered the macular condition to be a central serous retinopathy.

April 19, 1952—Vision in the right eye was 20/30. Fundus examination revealed that the macula had lost its edematous appearance.

April 25, 1952—The patient complained of return of blurred vision. Again fundus examination revealed the macula to be edematous in appearance.

June 5, 1952—Vision in the right eye was 20/30, and in the left eye, 20/30. The patient complained that objects seen with his right eye had a gray appearance.

June 18, 1952—The patient stated that the vision in the right eye had cleared following his last visit, but that blurring and distortion of vision in the right eye had returned again on June 17. Questioning revealed that not only the shape but also the color of objects seen with the right eye appeared distorted; the objects appeared slightly more brownish or grayish as compared to those seen with the left eye. Vision in the right eye was 20/30, and in the left eye, 20/20. The fundus was examined with the pupils dilated. The macula had a succulent appearance, with loss of the usual foveal reflex. In the temporal periphery there was an unpigmented solid detachment, apparently in the extreme periphery and located over the insertion of the external rectus muscle. The intraocular tension was 28 mm. Hg in the right eye and 26 mm. Hg in the left eye, Schiøtz.

June 24, 1952—Vision in the right eye was 20/30, and in the left eye, 20/20. Fundus examination showed a definite solid detachment in the temporal periphery. The surface was grayish in appearance, and the anterior edge was mottled.

The eye was enucleated. The pathologist's diagnosis was malignant melanoma, spindle cell, subtype B.

PATHOLOGIC REPORT

Cornea: A central area of the cornea had been removed for use as a transplant, but the remaining peripheral portions of the cornea were entirely normal. The angles of the anterior chamber were open and free of exudate.

Iris and Ciliary Body: The iris and ciliary body were of normal appearance and showed no areas of infiltration. The crystalline lens was in place and showed no areas of opacity.

Retina: The retina was elevated over the area of the tumor (fig. 5). The tumor began just at the edge of the ora serrata. A minimal serous exudate separated the retina from the underlying tumor. The usual retinal layers were evident, and no pathologic features of note were seen (fig. 6).

Optic Nerve: This showed no areas of infiltration and gave no indication of neuritis or papilledema.

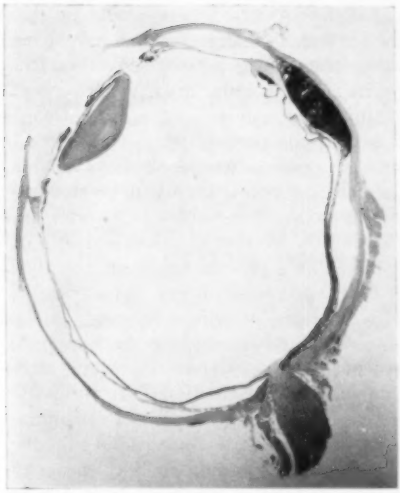


FIG. 5—Case 2. Section of right eye, showing location of the tumor near macula.

Choroid: In the temporal periphery the choroid was occupied by a mass of solid tumor cells of the spindle cell subtype B. There was a minimal amount of pigmentation. There was a moderate number of vascular channels.

No sections through the macular area were available.

Diagnosis: Malignant melanoma of the choroid, spindle cell, subtype B.

COMMENT

Two cases have been presented which exhibit features deserving comment.

Both of the patients had initial symptoms that were related to a defect in the central vision. Both patients described a haziness of the vision and some subjective color change; the first described an amber appearance to objects, and the second a grayish or brownish appearance. In the first patient a paracentral scotoma in the central visual fields was demonstrated; in the other there were ophthalmoscopic changes similar to central serous retinopathy. In the first patient, although changes of typical central serous retinopathy were not found, macular edema was evident.

The time intervals are of interest. In the first case there was a period of nine

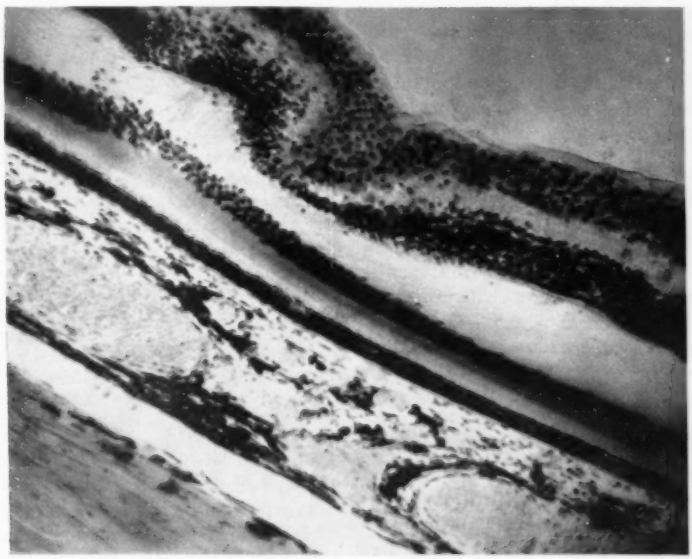


FIG. 6—Case 2. Retinal area near the macula.

weeks between the time of the first visit to an ophthalmologist and the time at which a tumor was easily detectable in the periphery. In the second case there was an interval of ten weeks between the time of the first visit of the patient and the time when a tumor was easily visible ophthalmoscopically. In both cases results of phosphorus 32 studies indicated a possible rapid growth of the tumor cells. In both instances the tumor was located in the temporal periphery of the choroid. Such a position would give a nasal peripheral field defect which in the early stages might be obscured because that portion of the field is normally not observed because of the nose. In the case of the first patient, the origin of the tumor may have been as far forward as the posterior part of the pars plana of the ciliary body. In all probability, direct ophthalmoscopy with the pupil moderately dilated does not give a view more anterior than the equator.

Histopathologically, both tumors were malignant melanomas of the spindle cell subtype B. In the one case in which the macular area could be studied, the retina in this area was separated from the choroid by an underlying pink-staining fluid; this fluid was not a characteristic of the area of detachment adjacent to the tumor.

Some fine cystic changes were seen in the macula. It is interesting to speculate concerning the mechanism of these changes in the macula. The first possibility is that the macular changes represent a serous edema which is an extension from the area of serous edema surrounding the tumor. In favor of such an opinion is the knowledge that a serous retinal detachment may occur in a portion of the periphery opposite to the solid tumorous detachment. Against this opinion would be the fact that the characteristics of the detachment in the macular area differed from those of the detachment surrounding the tumor.

Another point of view would be that the macular changes represent something resembling a toxic effect on the retina at the macular area. What type of change this can be, cannot be determined at the present time. In favor of such an opinion would be the fact that the macular area is known to be susceptible to change when there is a severe inflammation in the anterior segment of the eye. This process has been observed in cases of corneal ulcers and associated iritic changes in which the rest of the posterior fundus may be entirely normal except for the signs of degenerative change in the macula itself. In the present cases the changes were not inflammatory, but it is quite conceivable that the presence of a tumor in the eye may change metabolic processes to a degree sufficient to affect elements in the macular area.

SUMMARY

Two cases are presented in which the sequence of events is of particular interest. This sequence of events consisted in initial complaint of disturbance of central vision; macular edema, revealed by ophthalmoscopy; early macular changes, detected by scotometry. These events led to the discovery of a malignant melanoma located in the temporal periphery. The authors have not noted this sequence of events in other patients.

DISCUSSION

BERTHA A. KLIEN, M.D., Chicago: The association of retinal macular lesions with malignant uveal melanomas is possibly more common than the absence of such reports in the literature leads us to believe. The recognition of this relationship, once the diagnosis of malignant tumor is established, is of purely theoretic interest, but a sequence of events such as has been demonstrated by the authors makes it of practical importance.

The following slides are from the left eye of a man, 46 years old, who had noted a brown spot in the iris of his left eye three years prior to its enucleation. For two years after the dis-

covery of this spot, vision of this eye remained completely normal. During the last year there was blurring of vision of the involved eye, occurring at infrequent intervals. These attacks lasted a few days, and vision always returned to normal. During the last month, the loss of vision during the attacks was more severe, the attacks were more frequent, and vision remained impaired in the intervals between attacks. There was no pain.

At the time of enucleation the vision of this eye was 20/50. The intraocular tension was 35 mm. Hg. The fundus was easily visualized and appeared normal.

Histologic examination revealed a malignant melanoma of the nasal iris of the mixed cell type, which had broken through both surfaces of the iris, obliterating anterior and posterior chambers on the left side.

The temporal chamber angle was open, but tumor cells were implanted into the anterior portion of the ciliary body and lined the trabecular meshwork and the anterior surface of the iris root. Small hemorrhages were scattered through the otherwise normal iris stroma and lined the free surfaces of the tumor.

The optic nerve was normal except for a slight retrodisplacement of the cribriform plate. The pathologic findings in the posterior segment were limited to the macular region, which showed the manifestations of a serous retinopathy: destruction of the percipient retinal elements in the fovea centralis, edematous imbibition of the adjacent retina, and an extensive detachment of the internal limiting membrane by a serous coagulum. There was one small retinal hemorrhage on the nasal incline of the clivus. A small amount of the intraretinal transudate had reached the subretinal space, but there was as yet no irritative proliferation of the pigment epithelium.

On the outside of the detached internal limiting membrane there were some granular deposits—either cellular debris or tags of tissue from the nerve fiber layer or albuminous or fibrinous material precipitated out of the transudate—such as might cause the white dots which are found so frequently in the clinical picture of this condition.

The destruction of the foveal cones indicated either repeated attacks or one severe, prolonged one. The history of the visual disturbance given by the patient suggests the former condition.

This case has, in common with the author's two cases, the history of an intermittent disturbance of central vision—the initial and only complaint concerning an eye which was found to harbour a not-too-obvious malignant melanoma of the uveal tract.

Drs. Fry and McDonald have offered two possible explanations for the pathogenesis of the macular damage in their cases. A third possibility would be damage to the walls of the perimacular vessels by toxic by-products of the tumor, causing increased permeability, conceivably but not necessarily by way of angiospasm. A low-grade reversible organic damage, to the capillary endothelium for instance, could also produce the picture of central serous retinopathy, of chorioretinopathy, or even of choroidopathy, similar to that produced by angiospasm.

With this concept of the pathogenesis of the distant macular damage, the tumor producing it need not be located in the temporal periphery but could involve any portion of the uveal tract. It would have to have certain toxic properties such as may develop from tissue necrosis or decomposition of hemorrhage.

The authors' advice to examine carefully the fundus periphery of eyes with central angiospastic (serous) retinopathy or chorioretinopathy for hidden malignant melanomas is seconded by this discusser.

EYE PROTECTION AGAINST SMALL HIGH-SPEED MISSILES

H. W. Rose, M.D.
RANDOLPH AIR FORCE BASE, TEXAS
BY INVITATION
and
George M. Stewart
EDGEWOOD, MARYLAND
BY INVITATION

In spite of improved methods of localization and great progress in surgical procedures, penetration of the eye by a foreign body is still a serious event, and the prognosis, especially if it is a nonmagnetic foreign body, is often not favorable. Prevention of penetrating ocular wounds must be our aim. The profound influence of the loss of visual function or of the loss of the eye on a man's earning capacity, his recreational activities, and his military usefulness justifies the extensive use of protective lenses.

Industry and the Armed Forces presently protect the eye against perforating wounds from foreign bodies mainly with hardened glass lenses. The resistance of these lenses to breaking is gained by introducing stresses in the surfaces through heating and sudden cooling. It is customary to test these lenses by means of a dropping steel ball 23 mm. in diameter and weighing 44 grams. Specifications of the American Standards Association (ASA) and the Federal Government require that a lens should have the ability to withstand the impact from such a ball dropped 125 cm. (50 in.). A ball falling from this height has a velocity of about 17 feet per second. In a comparison of unhardened glass lenses and hardened glass lenses by means of this dropped-ball test, hardened lenses are unquestionably superior.

Previous investigators[1] for the American Society of Safety Engineers had shown that results similar to those obtained with hardened lenses could be obtained when subjecting various plastics to the dropped-ball test. This same group has reported that glass was somewhat superior to plastics in a modified drop test in which a dart weighing 44 grams, pointed with a gramaphone needle, was used. Furthermore, they found plastics superior to hardened glass when a 3 mm. steel ball bearing was used as a missile.

Our own research was stimulated by clinical observation of perforating eye wounds in industrial workers and flying personnel. The foreign bodies which were most often observed had as their largest dimensions, 1 or 2 mm. To penetrate the cornea or sclera, such small missiles must have considerably higher velocities than larger missiles.

No comprehensive physical theory of protective lenses was available. It seemed reasonable, however, to make the following simple assumptions. If a slow heavy object with flat surfaces or curves of large radius impinges on a glass or plastic lens, elastic deformation takes place, leading to a break if the limits of elastic deformation of the material are exceeded. After such an impact the impinging missile is often rejected

---

Dr. Rose is from the School of Aviation Medicine of the United States Air Force. Mr. Stewart is a member of the staff of the Chemical Corps Medical Laboratories of the United States Army.

Presented at the Sixty-First Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 14-19, 1956, Chicago.

against its original direction in spite of a complete break of the lens. On the other hand, a very small particle must, due to its smallness, have a stronger curvature or only small flat areas between edges. If it has sufficient velocity, such a small particle can burrow through the material of a protective lens, destroying in its path part of the microstructure of the material. The penetration of such a small missile can, but must not necessarily, be accompanied by fracture due to deformation.

Hardening of a glass lens by heat treatment seems to increase resistance to elastic deformation. If, however, a small missile should burrow through the hardened skin, tensions set up by fast cooling would be released and would lead to breakage of the hardened lens. The small missile would concentrate its energy in a small area and could destroy the hardened skin on one side even if it exerted insufficient force to bend the whole lens beyond the limits of elastic deformation.

To test this hypothesis, about 800 lenses were subjected to the impact of small missiles. The lenses in this group were made of unhardened glass, hardened glass, laminated glass, and allyl casting plastic. Each kind of lens material was used in two base curves (9 dp and 12 dp) and three thicknesses (2.5 mm., 3 mm., and 3.5 mm.). After extensive experimentation with powder guns and various air-pump guns, a helium-gas gun was used for most of our experiments (fig. 1). A storage cylinder provides helium gas under pressure to a small chamber. A solenoid-controlled valve connects the chamber to the muzzle-loaded barrel. In all ex-

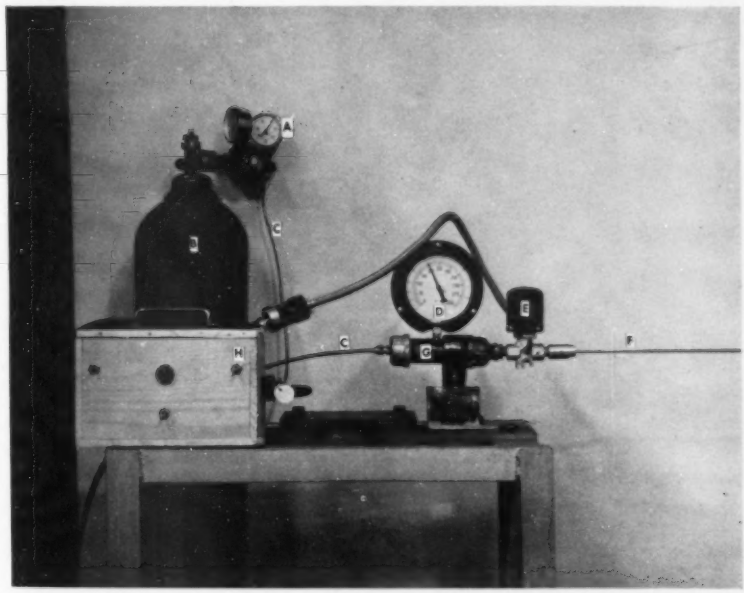


FIG. 1—Helium gun. A—pressure gauge; B—helium tank; C—pressure tube; D—low-pressure gauge; E—solenoid valve; F—gun barrel; G—pressure chamber; H—solenoid control.

periments presently reported, the velocity of the missile was determined from the time interval between the breakage of two metal screens located 10 cm. (4 in.) apart in the path of the missile (fig. 2). The lenses were mounted in rubber.

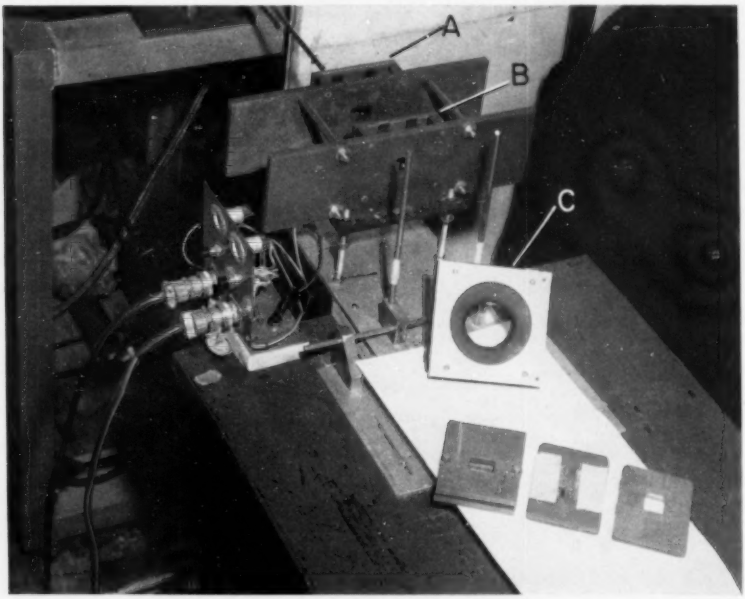


FIG. 2—Velocity-measuring device. A—first screen; B—second screen; C—lens holder.

An adhesive, separated by an air space, was put behind the lens to determine whether or not particles of the lens or the missile moved behind the rearward plane of the lens.

The ballistic limits were determined by plotting the partial and complete penetrations of the lenses (fig. 3), and by computing the median velocity of the range in which both partial and complete penetrations occurred. The shooting as well as the velocity measurements proved to be rather difficult. We have not yet been able to shoot and aim the small missile at velocities of more than 1600 feet per second. At velocities below 250 feet per second the screens slowed the missile down and deflected it excessively. Table I contains the ballistic limits of lenses which have been determined at present. Improved timing devices using the interception of a light beam are under construction. The determination of the ballistic limits of various other lenses and the use of other missile sizes and shapes are planned.

Each of the ballistic limits reported for glass lenses in table I is based on about 100 shots. None of about 10 shots with 1 mm. spheres at speeds of 1600 feet per second was able to penetrate the laminated lenses. Similarly, none of 10 shots with the 1 mm. missile at 1600 feet per second velocity produced more than a barely visible dent in the surfaces of the allyl plastic lenses. Since presently available velocities do not even ap-

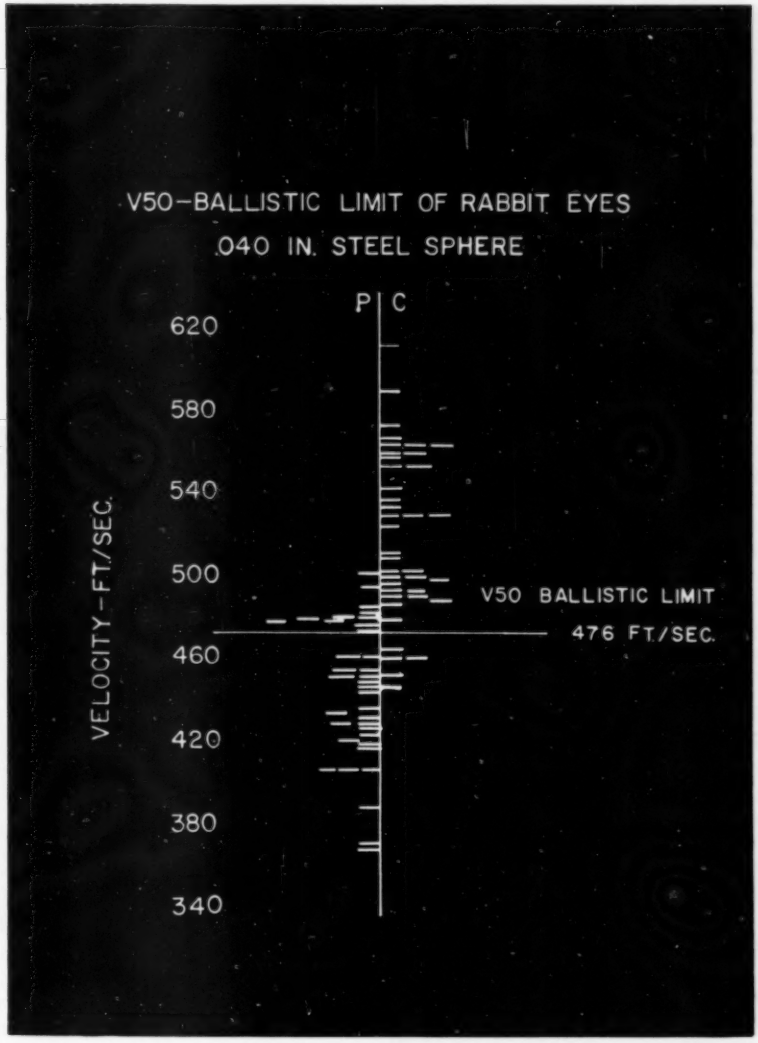


FIG. 3—Ballistic limit of rabbit eyes for .040 in. steel sphere.

proach the ballistic limits for the two kinds of lenses, their testing must await further developments.

The most striking result of our experiments is the gross inferiority of the hardened glass lenses for the impact of the 1 mm. steel spheres, when compared with unhardened glass lenses.

Since hardened glass lenses are superior in resistance to the impact of 17

TABLE I
BALLISTIC LIMITS FOR PROTECTIVE LENSES IN FEET PER SECOND

	1 MM. STEEL SPHERE 3.7 MG.	2.36 MM. STEEL SPHERE 53 MG.	1 MM. STEEL CYLINDER 4.6 MM. LONG
Hardened glass 3.5 mm. thick, base curve 9 dp	317	200	——
Hardened glass 2.5 mm. thick, base curve 12 dp	375	——	——
Rabbit cornea	475	325	240
Unhardened glass 3.5 mm. thick, base curve 9 dp	——	200	——
Unhardened glass 2.5 mm. thick, base curve 12 dp	1000	——	——
Laminated glass 2.5 mm. thick, base curve 12 dp	More than 1600	——	——
Plastic 2.5 mm. thick, base curve 9 dp	More than 1600	——	——

mm. and 23 mm. steel balls but inferior to untreated glass lenses under the impact of 1 mm. steel balls, there must exist an intermediate size of missile to which both unhardened and hardened glass lenses are equally resistant. The results given in column 2 of table I indicate that at least for spheres of steel, this intermediate size must be close to 2.36 in diameter.

Unhardened glass lenses break into splinters with sharp edges and points. Hardened glass has been claimed to break into less dangerous squarish pieces. The results of our tests do not support such claims. Neither the lenses hardened with a wide variety of timing in our own laboratories nor the lenses hardened by our supplier broke regularly into squarish pieces. The vast majority of the hardened glass lenses broke, at least partially, into sharp-pointed dagger-like pieces (fig. 4). Complete penetration of unhardened as well as of hardened glass lenses was accompanied by the deposition of considerable numbers of fine sharp splinters on surfaces located back of the glass lens. This occurred even if the missile was rejected back on its previous path. Figure 5 shows deposition of splinters on a rabbit eye which was located behind a breaking hardened lens.

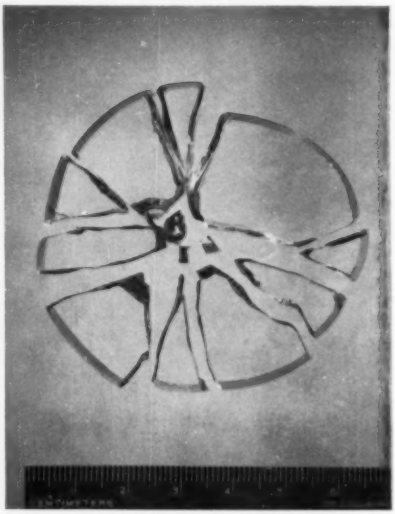


FIG. 4—Broken hardened lens.

A comparison of the ballistic limits of the rabbit cornea and that of hardened lenses yields the surprising result that for a 1 mm. steel sphere, the rabbit cornea has greater resistance to penetration than a hardened glass lens of 3.5 mm. thickness.

One must therefore conclude that for steel missiles of about the size most often observed clinically in penetrating

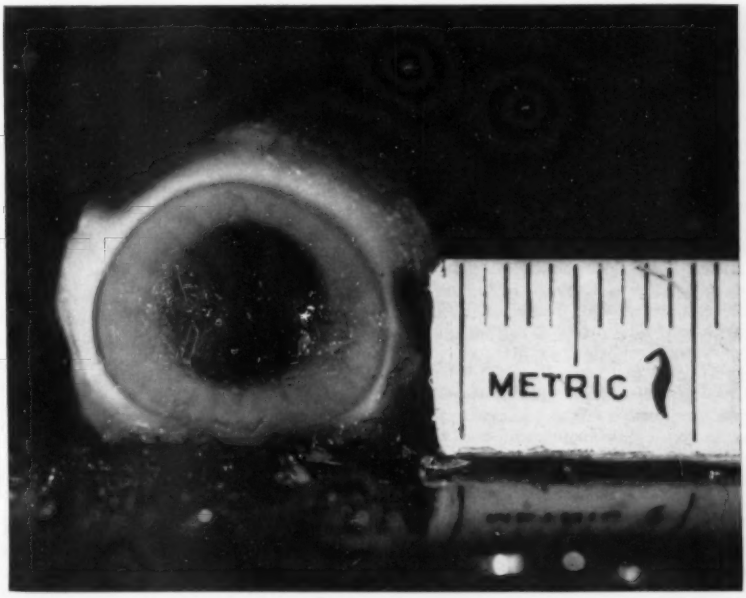


FIG. 5—Rabbit eye with glass splinters from broken hardened lens.

wounds of the eye, hardened glass lenses offer inferior protection as compared with unhardened lenses. Since hardened glass lenses break at velocities below the ballistic limit of the (rabbit) cornea, they are, for missiles 1 mm. in diameter, not a protection but a hazard due to secondary missiles.

It is suggested that under conditions in which small missiles might endanger the eye, only protective lenses constructed from allyl plastic, laminated glass or unhardened glass be utilized. Plain glass lenses should be considered only when plastic and laminated glass are technically or economically not feasible. For protective purposes, plain unhardened glass must have a thickness exceeding the 2 mm. commonly used in corrective lenses. Allyl casting plastics seem at present to be the most desirable splinter-protective lens. They offer a reasonable degree of scratch resistance. If, however, abrasion is a limiting factor, as in operations where grit and sand are unavoidable, laminated lenses may offer a reasonable compromise.

REFERENCE

1. National Safety Council: Plastic Eye Protectors, Final Report on the A.S.S.E. Research Project, Chicago, 1947.

DISCUSSION

ARTHUR H. KENNEY, M.D., Louisville, Kentucky: This paper is a significant addition to the widening field of preventive medicine. Dr. Rose and Mr. Stewart are to be congratulated on their investigations clarifying a facet in the technical study of safety lens materials which heretofore has not been reliably explored. Not only is their research into minute foreign bodies of concern to military operations but it is also directly in line with widespread civilian experience, in which we are most commonly faced with small missiles in the management of intraocular foreign bodies. A review of Sweet localization studies in the past five years by roentgenologists in Louis-

ville confirms the assertion that almost all foreign bodies localized in civilian practice are the size of BB and buckshot pellets or smaller.

Two inherent problems that beset the study of high speed missiles are (1) uncertainty of actual velocities encountered in military and civilian injuries, and (2) uncertainty of experimental velocities actually delivered by test apparatus. The prototype of experimental studies in this field has been the report of the American Society of Safety Engineers entitled "Plastic Eye Protectors," as published by the National Safety Council in 1947. With acknowledged allowances of at least plus or minus 8 per cent, they studied velocities of 50 or 90 feet per second up to 400 or 500 feet per second, using a gas-discharged pellet and a solenoid valve (Clark-Cooper Type 541), quite similar to the equipment used by Dr. Rose and Mr. Stewart. As our own studies have indicated, they found impact resistance to be greatly influenced by lens thickness. (Statistically this varies according to the cube of thickness.)

Dr. Rose and Mr. Stewart have gone beyond the 1947 study in establishing ballistic limits for glass and plastic materials expressed as the velocity in feet per second required to fracture various lens materials. They have also increased the velocity ranges to approximately 1600 feet per second. It would be additionally informative if an L_{50} type of expression or percentage of fractured lenses per test batch were established for the fracturing velocity. In most impact studies of lenses undesirably wide scattering of values is found, and manufacturers should therefore strive to narrow this range or to increase the uniformity of their products.

In discussing heat-treated or safety-glass lenses, the word "hardened" is really a commoa misnomer. Knoop-Peters' microindentation of hardness or adaptable scratch tests show that these heat-treated lenses are actually less hard than conventional crown glass. The word "toughened," as used by Lueck (Lueck, I. B.: Toughened Safety Lenses, Rochester, Bausch and Lomb Optical Company, Scientific and Technical Publication No. XXIII), is more accurately chosen. The immense practical value of conventional, heat-treated or toughened glass lenses has been amply demonstrated by the huge reduction which they have effected in industrial eye injuries. Now the further, protective value of allyl resin lenses above and beyond safety glass is demonstrated by Rose and Stewart. Our own studies of low velocity and chemical problems (Keeney, A. H.: Lens Materials and The Prevention of Eye Injuries, Springfield, Charles C Thomas) strongly endorse the thesis that allyl resin is the safest material currently available for spectacle and goggle lenses.

A PROXIMALLY ILLUMINATED BRONCHOSCOPIC TELESCOPE UTILIZING QUARTZ-ROD LIGHT TRANSMISSION

PAUL H. HOLINGER, M.D.
KENNETH C. JOHNSTON, M.D.
CHICAGO, ILLINOIS

THE high light conductivity of quartz has been used frequently in the past to transmit light into the body cavities to facilitate examination. In recent years a bronchoscopic adaptation of this principle has been perfected by Fourestier, Gladu and Vulmière[3] and has been utilized extensively for endoscopic photography by Dubois de Montreynaud et al.[2] In this system, the concentrated beam of a relatively large, external, proximal lamp is conducted to the distal opening of the bronchoscope by a quartz rod. The quartz rod is placed in the light-carrier canal of the conventional distally illuminated type of bronchoscope. This, in effect, gives distal illumination of far greater intensity than that which may be obtained from any lamp small enough to be placed in the distal end of the tube.

In adapting this system to our own use (fig. 1), the equipment has been modified by making the quartz rod an integral part of the telescope, rather than of the bronchoscope. A six-to-eight-volt automobile lamp is placed in a housing, through which air is drawn for cooling purposes. The lamp and housing are fixed either to a direct-view or to a right-angle bronchoscopic telescope, with a flexible rubber hose for the cooling air current leading from the lamp housing to the control box in which the cooling fan is located. An appropriate condenser lens *and* prism in the lamp housing direct the image of the filament of the lamp to the proximal end of the quartz rod,

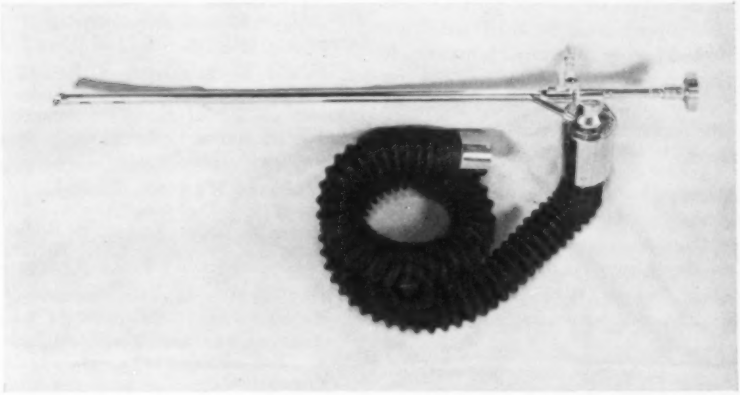


FIG. 1—Bronchoscope and combined telescope, quartz rod with lamp house and rubber hose for cooling air current.

Presented as a *New Instrument* at the Sixty-First Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 14-19, 1956, Chicago.

which in turn transmits the light to the distal end of the telescope. An additional feature is a tiny tube which runs the length of the quartz rod and telescope. This carries a small stream of air, which is blown across the distal telescope optic to prevent fogging and spotting of the lens if the patient should cough.

This system of optics and illumination* has magnification and brilliance enough to permit routine color still photography and motion pictures with an 8 mm. camera, and it can be modified for 16 mm. motion pictures. The advantages of this system for photography are its simplicity, the wide telescopic field, and the magnification of the peripheral lower lobe and upper lobe bronchi which is obtained. Photographically, however, it does not compare in color quality or depth of field with the results obtained with the open-tube cameras previously described.[1,4]

There are two distinct advantages in fixing the quartz rod to the telescope rather than placing it in the light carrier of the bronchoscope: (1) routine inspection and instrumentation are not hindered by the somewhat cumbersome proximal lamp and its air-cooling device; and (2) by making the quartz rod and telescope a rigid unit there is less likelihood of breakage of the brittle quartz.

The potentialities of this system are greater in special aspects of diagnosis and therapy than simply in those of photographic purposes. Studies are now in progress on the selective absorption of certain fluorescent materials, with differentiation apparent following the transmission of ultraviolet light by the quartz.

*Manufactured by American Cystoscope Makers, Inc., New York.

REFERENCES

1. Brubaker, J. D., and Holinger, Paul H.: An endoscopic color camera for otolaryngology and broncho-esophagology, J. Biol. Photographic A., 15:73-93 (Dec.) 1946.
2. Dubois de Montreynaud, Jean-M.; Edwards, Roger J., and Gladu, Andre-J.: A new method of bronchoscopy with cinematography and photography, Laryngoscope, 66:637-657 (June) 1956.
3. Fourestier, M.; Gladu, Andre-J., and Vulmière, J.: Perfectionnements a l'Endoscopie Médicale; Realisation Bronchoscopique, La Presse Medicale, 60:1292-1294 (Oct. 1) 1952.
4. Holinger, Paul H., and Brubaker, J. D.: An endoscopic motion picture camera for otolaryngology and broncho-esophagology, J. Biol. Photographic A., 15:171-192 (June) 1947.

THE SELTZER NASOMETER FOR MEASURING NASAL PATENCY

ALBERT P. SELTZER, M.D.
PHILADELPHIA, PENNSYLVANIA

MANY types of nasal obstruction occur and lessen the amount of air coursing through the nasal passages. Whether this condition is caused by the presence of a foreign body, by a deviated septum, by spurs or other bony growths, or by swollen soft parts, the general result is the same — it interferes with breathing through the nose, and there is consequent necessity for mouth breathing if both nasal passages are occluded to any considerable degree. The obstruction may not always be present within the nasal cavity but may exist at the posterior extremity, the choanae.

The writer has devised a mechanical means of measuring, with a reasonable degree of accuracy, the functional capacity of the nasal cavity in terms of the passage of air in breathing. The device consists basically of two recording pressure gauges, which make parallel records on a paper tape (fig. 1). The over-all size of the instrument is 12 inches by 10 inches by 7.5 inches.

Each pressure element is made up of a pair of metallic diaphragms, approximately 5 inches in diameter, with circular corrugations. There is one eighth of an inch between the two diaphragms. The center of one diaphragm is free to move in and out as the diaphragms expand and contract. When approximately two inches of water pressure is introduced between the diaphragms, the center of the free diaphragm moves about one eighth of an inch. A flexible plastic hose connects the chamber between the diaphragms and one of the nostrils of the subject to be examined. When air is exhaled from the nostril, pressure is built up between the diaphragms, causing them to expand. On the inhalation of air, the pressure between the diaphragms is reduced and they contract. Accordingly, with each exhalation and inhalation, the movable point on the diaphragm swings approximately one eighth of an inch to either side of its rest position.

The free end of the diaphragm is connected, by means of a link, to a lever which is pivoted at one end. On the other end of the lever is a pen, which leaves a trace on the tape as it responds to the motion of the diaphragm. This linkage is such that the motion is amplified, so that when the diaphragm moves one eighth of an inch, it causes the pen on the end of the lever to move one inch. In this way, the pen makes a mark that may swing as much as from one inch to the left of the rest position to one inch to the right of the rest position, as the patient inhales and exhales.

The paper recording tape is 4 inches wide, and each of the pens operates over half of the width of the tape, which is driven by a clock motor at a rate of approximately six inches per minute. Each of the pen levers has an adjustment screw in the center so that the rest position can be readjusted if it should drift with time. Mechanical stops are fastened to each of the pivot shafts on the pen lever so that they cannot swing far enough to permit the pen to go over the edge of the paper.

From the Department of Otolaryngology, Mercy-Douglass Hospital, Philadelphia.

Presented as a *New Instrument* at the Sixty-First Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 14-19, 1956, Chicago.

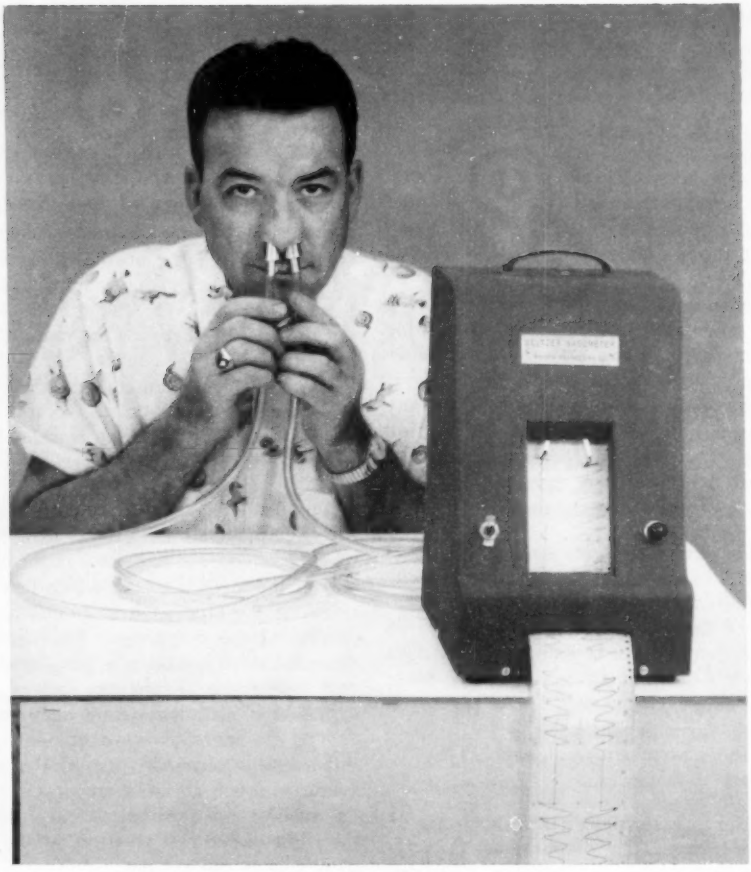


FIGURE 1.

The following case illustrates the usefulness of the nasometer:

The patient is a white female, 25 years of age, married, and has two children. She came for consultation concerning a rhinoplasty, because of a deformity of the external nose. Examination revealed that the turbinates on the left side were atrophic, with bluish surfaces covered with mucoid secretions. A catheter tube could not be passed on the left side, and digital exploration revealed bony atresia in the region of the left choana, which was congenital. All fluid secretions were removed by the patient blowing her nose, and all dried residue was then carefully extracted. The technique was carried out in a quiet room. The patient was instructed in the use of the instrument. Emphasis was placed on the necessity for keeping the mouth completely closed, and for breathing through the nose only, both on exhalations and inhalations, for a period of one-half to one minute. The tip of each tube was then inserted into the corresponding nostril, firmly enough to make the passage airtight. During the short respiration period, the record was made. The graph indicated that the right nasal passage was clear, but that the left nasal passage was almost completely closed by the deformity.

This type of record permits a greater degree of accuracy in determining how well each nasal cavity functions, and it

can make clear to the surgeon, as he proceeds with an operation, the point at which the two nares are of equal capacity. The simplicity of the test makes it possible to repeat it three or four times.

The result of the test is consistently dependable, unless a large perforation of the septum allows air to pass through from the free side. This can be temporarily corrected by placing a thin layer of cottonoid, or similar material, over the perforation to impede the free flow of air through the perforation in the nose.

The patient does not see the graph as it is being made, because the plastic hose which carries the recording pen is sufficiently long to allow the subject to sit on the opposite side of the instrument.

An important advantage of having a record of this kind, aside from its use by the surgeon during and after an operation for the correction of impaired nasal breathing, is its value as legal evidence, if such need should arise, in relation to any plastic surgery that may have been performed. It also helps to convince the doubtful patient that the physician's recommendation of a rhinoplasty is justified.

Now that the instrument has been used in more than one hundred cases, a definite conclusion is that it affords a useful record for the surgeon's files.

FIXATOR FOR THE VERSION TEST

WALTER H. FINK, M.D.
and
ROBERT J. FINK, M.D.
BY INVITATION
MINNEAPOLIS, MINNESOTA

FIG. 1—Fixator for the version test.

THE fixator for the version test consists of a handle, to which is attached an arm fifteen inches long (fig. 1). The arm is attached to the handle by means of a rotary joint which permits the arm to be rotated in any direction. A white sphere, one inch in diameter, is attached to the arm and can be moved by sliding it on the arm.

The patient holds the handle 15 inches in front of him. He is asked to fixate the white ball and to follow it as the arm is moved in the various cardinal positions. This permits the examiner to have both hands free in doing the cover test and in measuring the deviation in the cardinal position of gaze.

The fixator is especially helpful in examining the lower fields, when it is necessary to use one hand to hold up the lids.

Presented as a *New Instrument* at the Sixty-First Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 14-19, 1956, Chicago.

A LACRIMAL PROBE-NEEDLE

ORWYN H. ELLIS, M.D.
LOS ANGELES, CALIFORNIA

A LACRIMAL probe-needle has been found to be helpful in the treatment of cases of chronic dacryocystitis which do not respond to the more simple types of treatment. Its use has been expanded to include other abnormal conditions of the tear sac, as will be described later in this presentation. Cassady has advocated the use of a one-inch needle for washing the sac, and he uses the same needle as a probe. Any decision for treatment should, of course, be preceded by a careful record of the history of the case and a thorough investigation of the lacrimal passages. The detailed anatomy of the lacrimal area and detailed descriptions of examinations pertinent to the various diagnoses are found in standard textbooks and will not be repeated in this report.

Congenital dacryocystitis may be caused by a failure of canalization of the nasolacrimal duct. The lumen may be blocked by a mass of epithelial debris, especially near the nasal extremity, or a membranous blockage may occur at the nasal osteum. The nasolacrimal membrane is imperforate at the birth of the child in 84 per cent of the cases, although it usually ruptures before the onset of the secretion of tears, which occurs, on the average, when the child is three and one-half weeks old. Dacryocystitis may be unilateral or bilateral. It is frequently discovered soon after the onset of tearing, because of a chronic purulent discharge from the affected side. In many instances moderate pressure over the tear sac will open the simple block. In somewhat more severe cases, irrigating the lacrimal sac with colorless antiseptic solution will cure the condition. In the most stubborn cases, irrigation or even passage of a probe will not attain the desired result. Such a case will be discussed at this time.

In 1947, a patient with congenital dacryocystitis was seen in my office. The infant was a few months old, and his medical history and the results of examination were typical of this abnormality. Irrigation of the lacrimal sac had been followed by passage of the probe at repeated visits to the doctor's office, without improvement of the condition. The amount of the probe passed was measured by grasping the probe at the point at which it crossed over the eyebrow line, with the probe in place in the duct. Then, after removal, it was placed on the face in a position similar to that it had held in the sac. Each time this showed that the probe should have passed through the nasal end of the nasolacrimal duct and on into the nose. It is possible either that an unusually elastic membrane was present or that the nasolacrimal duct was longer than the bony canal, causing the probe to slide downward.

It was felt that a needle which would deliver the solution to the point of obstruction was needed. The probe-needle presented in this report was designed for use in this case. Over the years, additional uses have been found. It should be mentioned that after the duct has been probed, syringing may be dangerous and should not be done. Also, only colorless antiseptic solutions should be used for irrigation because of the danger of creating a false passage and permanently staining the tissue.

DESCRIPTION

The 20-gauge probe-needle is 7 centimeters (3 inches) long (fig. 1). The tip is rounded and smooth. The shaft of

Presented as a *New Instrument* at the Sixty-First Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 14-19, 1956, Chicago.

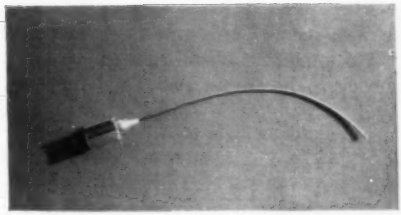


FIG. 1—The lacrimal probe-needle.

the needle is curved like the lacrimal probe, and the shank accommodates the regulation 2 cc. syringe for irrigation.

USES

This probe-needle is not used for routine irrigation or for examination and testing of the lacrimal sac. There are many cases of congenital stenosis of the lacrimal sac in which irrigation, using the regular lacrimal needle with the syringe attached, has not resulted in the solution entering the nose. In these patients it has been found very helpful to use the probe-needle rather than the lacrimal probe. The probe-needle is passed into the lacrimal sac exactly in the same manner as the simple probe. Usually some dilatation of the punctum is necessary. The probe-needle is passed down to and through the nasolacrimal duct, into the nose. The 2 cc. syringe, filled with colorless antiseptic irrigating solution, is attached to the shank of the needle, and the plunger is pressed. It is invariably found, in my experience, that the duct has been opened by this one procedure alone. It is a well established fact that once the membrane has been penetrated, either by solution or by probing, the condition has invariably been cured. In this instance, then, the probe-needle is recommended for use in place of the lacrimal probe in cases of congenital stenosis of the nasolacrimal sac.

In cases of old or neglected congenital stenosis seen in children, or even in young adults, the use of the probe-needle has been found to be of value. These patients respond neither to the usual irrigation nor to passage of a probe, nor to passage of the probe-needle. In these cases the nose is anesthetized, especially the inferior meatus. The area under the inferior turbinate is shrunken. In cases in which a good view of the posterior part of the inferior meatus cannot be readily obtained, the inferior turbinate is infracted (elevated medially). The probe-needle, threaded with a no. 4 dermal suture, is passed through the punctum, the sac, and the nasolacrimal duct until the tip of the needle appears in the inferior meatus of the nose. More dermal suture is passed into the needle at the shaft end; then, using a Hartman forceps, the suture is grasped at the tip and pulled out through the nose. While the suture is held at the tip of the nose, the probe-needle is removed. The ends are now tied together and fixed to the forehead with adhesive (fig. 2). It is recommended that the knot of the suture be covered with one piece of adhesive, then the loose ends bent inferiorly and covered with a second piece of tape. This firmly fixes the end, and there is little chance of slipping.

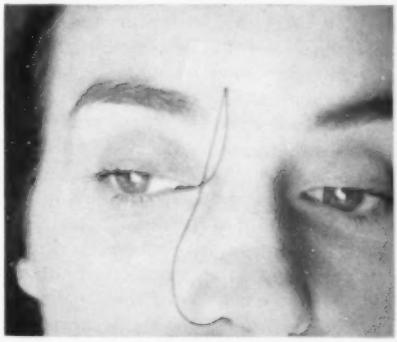


FIG. 2—Suture in place.

It has been found that the forehead is the best site for fixation of the knotted ends, for here the suture does not tend to cut through the side of the canaliculus. If the cheek or nose is used as a fixation site, the suture will promptly cut through

the tissue. To keep the suture in place, another piece of half-inch adhesive tape is put over it as it passes along the side of the nose. This keeps the suture from irritating the ala and helps to lessen the movement of the suture as it emerges from the canaliculus.

The suture is kept in place from four to six weeks. About this time the patient will volunteer the information that the epiphora has stopped. For removal, the suture is cut off just above the punctum, the knot from the forehead is grasped, and the suture is then pulled out through the nose.

The foregoing procedure has also been used with success in lacerations of the medial portions of the lid in which the canaliculus has been severed. In these cases the procedure is similar. The nose is anesthetized and a good view of the inferior meatus is obtained. The probe-needle is threaded with a dermal suture and is passed into the punctum. It rapidly emerges in the wound. The cut end of the canaliculus is usually quite readily identified after the bleeding is controlled, as it stands out from the rest of the tissue. Moreover, if the probe is passed to the nasal side of the wound and if the normal direction of the canaliculus is followed, the end of the probe should indicate the approximate position of the cut end. After the cut end of the canaliculus has been identified, the tissue around it is grasped with the broad forceps, and the probe-needle can be passed immediately into it, through the sac and nasolacrimal duct, and into the nose; the suture is then pulled through, and the procedure is completed as described above. Occasionally, but rarely, it is necessary to dilate the cut end of the canaliculus, although usually the probe-needle can be passed directly into it. When the cut, or nasal, end cannot be found by the above procedures, occasionally it has been possible to find it by using the regular curved gold lacrimal needle. The needle is passed through the uncut canaliculus (usually only one is severed) to the common canaliculus, then back out through the nasal side of the cut, emerging in the wound (fig. 3). This has been done successfully when other attempts to localize the cut end have failed. Again it is recommended that the suture remain in place from four to six weeks, or until the patient notices no epiphora with the suture in place.

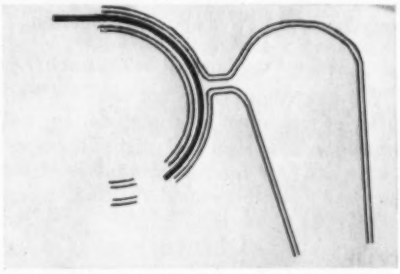


FIG. 3—Passage of the lacrimal cannula into one canaliculus and out the cut end of the other.

In a number of adults with epiphora, nasolacrimal stenosis and/or chronic dacryocystitis, the suture has been placed as described, but without success. It was thought that epithelization would occur, thus keeping open the nasolacrimal duct, but no improvement in adults with nasolacrimal stenosis has occurred.

SUMMARY

A new lacrimal probe-needle is presented. It has been found to be valuable in clearing nasolacrimal blockage, stenosis, and occlusion in infants. By its use, a dermal suture may be passed through the canaliculus and allowed to remain; in this manner, epiphora has been cured in neglected cases of nasolacrimal block in children, but no improvement has resulted when this technique has been tried in a few cases involving an adult. For lacerations of the canaliculus, the probe-needle has been used, with success, to thread the lacrimal apparatus with dermal suture.

AN IMPROVED NEEDLE HOLDER

ORVILLE E. GORDON, M.D.
CHICAGO, ILLINOIS

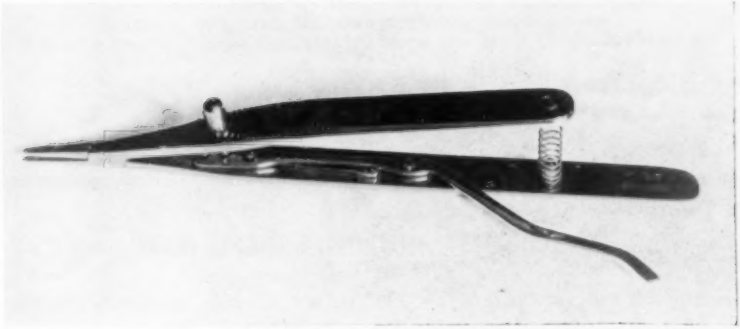


FIG. 1—An improved needle holder.

IN ophthalmic surgery, needle holders that fix the needle in position by a spring and catch are very popular because such a holder permits maneuvering the instrument without maintaining hand pressure to hold the needle in place.

The big disadvantage of this type of instrument is that the position of the fingers on the instrument must be changed in order to release the catch, and thus free the needle. Frequently moving the fingers on a needle holder while the needle is engaged in tissue will cause wavering of the needle and an increase of technical difficulty, such as a loss of the bite of tissue taken or dangerous gaping of a wound.

This needle holder was designed so that the needle can be disengaged by gentle pressure from the ring finger or the little finger without a change of position on the instrument.* It can easily be disassembled for cleaning. The pressure required for release of the needle can be adjusted.

Presented as a *New Instrument* at the Sixty-First Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 14-19, 1956, Chicago.

*Manufactured by Karl Ilg, Villa Park, Illinois.

In Memoriam

George Winston Burchfield.....Maryville, Tennessee
February 26, 1957

Clarence William Engler.....Cleveland, Ohio
February 23, 1957

James Dudley Goodman.....Elyria, Ohio
February 14, 1957

George Fay Gracy.....Harrisburg, Pennsylvania
January 1, 1957

Richard G. Hamilton.....Pittsburgh, Pennsylvania
May 22, 1957

William Rigby Jacobs.....Lewiston, Idaho
January 26, 1957

Harry Vincent Judge.....Albany, New York
March 3, 1957

Percy Kaufman.....New York, New York
March 3, 1957

Hugh Montgomery Lokey.....Atlanta, Georgia
February 23, 1957

Daniel Abell Russell, Sr.....San Antonio, Texas
February 2, 1957

Herman Eugene Yazel.....Kansas City, Missouri
January 19, 1957

Arthur Meyer Yudkin.....New Haven, Connecticut
May 3, 1957

TRANSACTIONS

American Academy of Ophthalmology and Otolaryngology

Official Publication of the American Academy of Ophthalmology and Otolaryngology
Published under the direction of the Editorial Board
WILLIAM L. BENEDICT, Rochester, Minnesota, *Editor*
W. HOWARD MORRISON, Omaha, Nebraska, *Associate Editor*
HENRY L. WILLIAMS, Rochester, Minnesota, *Associate Editor*
Printed by Douglas Printing Company, 109 North 18th Street, Omaha 2, Nebraska

All communications regarding the TRANSACTIONS should be addressed to
William L. Benedict, M.D., LL.D., Executive Secretary-Treasurer,
American Academy of Ophthalmology and Otolaryngology,
15 Second Street S.W., Rochester, Minnesota

THE ALUMNI DINNER MEETINGS

THERE are numerous pleasant traditions associated with the Annual Meeting of the American Academy of Ophthalmology and Otolaryngology. The Alumni Dinner meetings have developed into one of the more enjoyable of these traditions. It is readily understandable that all members of the Academy who had received their specialty training at a given institution would assemble for dinner after one of the scientific sessions. Early in the Academy's history these dinner get-togethers were unscheduled and somewhat spontaneous affairs; with the passage of time and with the remarkable growth of the Academy, it became necessary to organize them in advance. Attendance increased and the number of these groups multiplied. As the members of many of these alumni groups succeeded and prospered in the practice of their specialty, they became aware of the true depth of their indebtedness to their former teachers. Many of the organizations expressed their gratitude to their illustrious departmental heads by naming the dinners in their honor.

The officers of the Academy recognized the desirability and value of these group dinner meetings from the beginning. The Academy has done much to contribute to the success of these non-Academy functions by listing them in the Academy program, by printing and selling tickets for them, and by providing time for these meetings free from conflict with Academy functions. Apart from all this, however, there were numerous other factors which contributed in various ways to make these dinners flourish. There was a genuine need for an opportunity for social relaxation after a day's intense concentration at the full Academy program. The dinner meetings admirably fulfilled this need. Furthermore, these dinners provided an intimate atmosphere where opportunity was afforded to renew and to perpetuate the valued friendships established during the formative years of one's professional life. The informal exchange of ideas, unhampered by the restrictions imposed by formal presentation, constitutes one of the most successful means of obtaining useful information; the knowledge gained by attending the Annual Meeting was frequently supplemented at these dinners. The successful methods employed by others could be easily acquired and gainfully added to one's own list of diagnostic and thera-

peutic procedures. There was also the prospect of obtaining gems of information from one's former teachers, as well as the clarification of concepts which had proved to be incomplete or misunderstood. Furthermore, these dinner meetings served to enhance the reputation and the prestige of the parent institution from which these groups received their original specialty training. In addition to this, they served the interests of these institutions by affording opportunity to report to their alumni, news of departmental achievements, while learning the needs and the progress of its progeny. The height of the camaraderie associated with these dinners was reached when all the alumni in a given group received their training under the same departmental head. With changes in faculty personnel, and with the addition of new and strange faces, the feeling of close relationship between all the members of the group was somewhat diluted. These inevitable changes, which came with time and the growth of these groups, created new problems for their leaders.

The opinion was expressed that the time had arrived for a reappraisal of the aims, purposes, and possible objectives of these alumni organizations in an effort to create new and more impelling motivating attractions to maintain interest at the accustomed level. Among the many available ways to add purpose and usefulness to these dinner meetings would be the sponsoring of a research project. In order to promote the widest interest by the participation of all or most of the members, the research program preferably should be planned at the clinical level. There are many conditions so rare that any one person is unable to collect significant figures by working independently, but the incidence may be sufficiently great that the planned and pooled observations of a group might be meaningful. An alternative approach, which might be more suitable for some groups, is the creation of a fund for the purpose of sponsoring research on a specific problem selected, to be financed by the alumni groups and undertaken at the parent institution.

Such worthy objectives should add considerable interest and purpose for these alumni gatherings. Such a commendable goal as the promotion of research should add continuing motivation and maintain these delightful occasions at their present level of success.

G. G. G.

THE ANNUAL MEETING OF THE INTERNATIONAL COUNCIL OF OPHTHALMOLOGY

The annual meeting of the International Council of Ophthalmology was held in London at the Royal College of Surgeons on April 10, 1957.

There were present: Duke-Elder (President), Berens (Vice-President), Hartmann (Secretary), Amsler (Treasurer), Alvaro (Brazil), Arruga (Spain), Bietti (Italy), Charamis (Greece), Coppez (Belgium), Franceschetti (Switzerland), Lyle (Great Britain), Marshall (Canada), Palomino Dena (Mexico), Paufique (France), Samuels (U.S.A.), Thiel (Germany), Weve (Holland).

There were also present: Copper, co-opted Secretary in charge of the Index Ophthalmologicus, and François, the Secretary-General of the XVIII Congress.

A résumé of the main business of the meeting is as follows:

Regrets were expressed for the death of Sir Jamshedji Duggan, who represented Asia on the International Council; and congratulations were sent to Professor Márquez in Mexico, the

President of the XIV International Congress in Madrid in 1933, on the attainment of his eighty-fifth birthday.

The Treasurer's report showed that the finances of the Council were in a healthy condition, most countries internationally federated having paid their dues. It was reported that the Department of Health at Washington had given a grant of $10,000 towards the organizational expenses of the XVIII Congress in Brussels and to aid in the publication of the Proceedings. This gift was warmly welcomed.

The Gonin Medal for 1958 was awarded to Professor Alan Woods of Baltimore.

The Statutes of the International Federation and of the International Council, and the Rules for running International Congresses were considered in detail. It may be recalled that these were provisionally adopted at the International Congress in 1954; the revised rules will be supplied to all delegates of the federated ophthalmological societies throughout the world, and it is hoped that these rules will be finally adopted in the Congress at Brussels next year.

The report of the Committee for the Testing of Color Vision in Transport Workers was passed unanimously. Pseudoisochromatic plates are recommended as a means of testing, either those of Ishihara or the Swedish test of Bostrom of 1950. This will be brought up to the meeting of the Federation in 1958 for confirmation.

The Polyglot Dictionary of Ophthalmological Terms was discussed. This publication is now at a far advanced stage of preparation and it is hoped that it will be available for sale at the Congress in Brussels. The Dictionary is in five languages—English, French, German, Latin, and Spanish.

The Affiliation of Supranational Societies (groupings of regionally related nations) with the International Council was considered. It will be remembered that the Pan-American Association of Ophthalmology is associated with the Council in this way and sends a representative to its meetings. The progress of the development of a corresponding Pan-European Society of Ophthalmology was considered, and the Council decided to await its further development during the next year in the hope that the Federation would agree to its affiliation also. There is a similar movement to form an Asia-Pacific Academy of Ophthalmology representing nations bordering the Pacific Ocean; the Council also hopes that the organization of this new body will have advanced sufficiently to give consideration to it in 1958.

A request for the admission of the Polish and Rumanian Ophthalmological Societies to the Federation was received from these countries; to this the Council agreed on completion of the necessary formalities.

A report of a subcommittee to decide on the methods of inviting delegates to International Congresses was received and accepted. In essence it was decided that invitations could be made through diplomatic channels or, alternatively, the consent of the Government of the host country having been obtained, through ophthalmological channels, whichever method was easier in any particular case.

A suggestion that clinical research should be correlated in different countries throughout the world by the International Council was discussed, but a decision on the subject was postponed until the next meeting of the Council.

The President (Coppez) and the Secretary-General (François) of the *XVIII International Congress*, to be held in

Brussels in September 1958, reported on the progress of their arrangements. It would appear that both from the scientific and social points of view, the meeting promises in every way to be a success.

The Centenary of International Ophthalmology. In view of the fact that the first International Congress was held in 1856, the President was charged in 1956 to write a short history of the first hundred years of international ophthalmological relationships. The proofs of this book were laid on the table, and it was decided that the Council should present it as a gift to delegates attending the International Congress in 1958; thereafter the book will be sold on the open market.

A report was received from Copper on the state of the publication of the *Index Ophthalmologicus for 1958.* Preparations of this volume are well in hand, and it will comprise some 350 pages. Arrangements have been made for it also to be distributed to all delegates to the International Congress. It was also noted that there were some 1,000 copies of the Index Ophthalmologicus published in 1954 as yet unsold; in view of the fact that a new edition will appear in 1958, it was decided that a copy of the old Index would be sent free of charge to any ophthalmologist who applied for it.

The President of the Professional Association of German Ophthalmologists appealed to the Council to put on record their opinion initially given in 1933 that refraction of the eye was essentially a medical act which should be performed by medically qualified people; this the Council confirmed.

It was noted that the German Ophthalmological Society would celebrate its 100th anniversary in September 1957. All members of the Council were cordially invited by Thiel to take part in this meeting.

The next meeting of the International Council was fixed to take place in Brussels on September 6, 1958.

HOME STUDY COURSES

Application forms for the 1957-1958 Home Study Courses may be secured from Dr. William L. Benedict, Executive Secretary-Treasurer of the Academy, 15 Second Street S.W., Rochester, Minnesota. Registration should be completed before August 15.

The Courses are recommended by the American Board of Ophthalmology and the American Board of Otolaryngology.

The faculties include members of the American Boards and of the staffs of the leading teaching institutions throughout the country. This makes it possible to fully integrate the Courses with all other available postgraduate training.

INDUSTRIAL NOISE AND HEARING LOSS

WITH this issue, we begin the series of questions and answers on the subject "Industrial Noise and Hearing Loss" which was announced in the preceding issue of the TRANSACTIONS.

One of the purposes of the series is to acquaint the physician with the terminology needed in discussion of this subject. Accordingly, we have elected to begin the series with topics in which terminology will be important, because these topics will enter into a large share of the subject matter to be discussed throughout the series.

Normal hearing is the standard against which we make comparisons for the interpretation of test results. We need to agree on the meaning of "normal," however, particularly with respect to the decibel limits which permit us to say "A has normal hearing, B has not."

Another fact requiring clear distinction in terminology is that hearing may vary with time in the same individual. This is particularly true when the individual is exposed to noise. Thus, it will be necessary to distinguish between *transient* or *temporary* and *persisting* or *permanent* changes in hearing as the result of noise exposure, because both types of changes may occur. Each type is a matter of great interest in the total problem of noise-induced hearing loss.

The Subcommittee on Noise in Industry operates through the *Research Center*, 111 North Bonnie Brae Street, Los Angeles. Aram Glorig, M.D., is Director of Research, and Douglas E. Wheeler, Ph.D., is Field Representative. Howard House, M.D., is chairman of the subcommittee. At the Research Center a staff of full-time workers are engaged in research on hearing difficulties in industry and, to some extent, in the general population. The Center is supported by grants from insurance companies, the National Institute of Health, the American Academy of Ophthalmology and Otolaryngology, and other sources.

Questions and Answers

Question: How Do We Define Normal Hearing for Clinical and Industrial Purposes?

Answer: ARAM GLORIG, M.D.
Director of Research
Subcommitee on Noise
in Industry

Strictly speaking, normal hearing is defined by a reference level known as zero decibel loss, obtained by measuring the hearing in a large group of individuals. The present American reference level was derived from a study made by the United States Public Health Survey in 1935 and 1936. After a process of selection, an average of the measurements found in certain individuals was chosen to represent normal hearing for the general population. It is obvious that when an average value is used, there are individuals whose hearing is better or worse than this value. Consequently, like all other human senses, normal hearing is not a single value but can be said to be within plus or minus 15 decibels of the accepted zero at all frequencies, when zero signifies loss of hearing in decibels. Hence, minus values on all audiometric scales are necessary, since many individuals have hearing better than the average for the population.

Question: How Do We Define the Difference Between Transient or Temporary and Persisting or Permanent Hearing Loss?

Answer: GORDON HOOPLE, M.D.
Syracuse University
Syracuse, New York

The difference between the words *transient* and *persisting* is obvious. The difference is just as obvious when these terms are applied to hearing losses. An acute otitis media may produce a transient and a persisting loss. When an attack which has caused both has completely subsided, the individual who suffered the attack is left with a persisting (permanent) hearing loss. When the attack was still present, however, there would have been present an additional loss which could properly be called transient or temporary.

In hearing losses caused by industrial noise there is both a transient loss and a persisting loss. When an individual has been exposed for a sufficient time to an industrial noise of such a character that it can be responsible for the production of hearing losses, he may have both a transient and a persisting hearing loss. Some time after such an individual is no longer exposed to the noise the transient loss will disappear and only the persisting loss will remain. There is no evidence available to date which indicates the exact length of time after causation to such exposure for the transient loss to disappear. The Subcommittee on Noise in Industry of the Academy has research in progress which some day may provide more specific answers to this question.

Answer: C. STEWART NASH, M.D.
University of Rochester
Rochester, New York

Transient occupational hearing loss is an impairment of hearing that is temporary in nature, uncertain in duration, and discernible in one of two forms, either as (a) a temporary threshold shift, a condition that is self-correctable within a matter of hours; or (b) an acoustic fatigue, a condition that is self-correctable within a matter of months or years.

Persisting occupational hearing loss is an impairment of hearing that outlasts the period of acoustic fatigue and may be permanent in nature.

A permanent occupational loss of hearing is an irreversible condition that results from irreparable degeneration of the terminal nerve endings of the auditory nerve. An acoustic fatigue is a reversible condition resulting from a recoverable diminution of the excitability of the auditory nerve mechanism as manifested in a temporary loss of power or capacity to respond to normal stimulation.

Answer: MEYER S. FOX, M.D.
Marquette University
Milwaukee, Wisconsin

Transient hearing loss and *persisting hearing loss* are common terms used to describe the loss of hearing which follows exposure to industrial noises.

Transient hearing loss, in its broadest sense, refers to the temporary depression of hearing which results from exposure to intense sounds or noises and which disappears after the individual is removed from the noisy environment. It has been referred to as "temporary threshold shift." Some investigators have defined temporary threshold shift as that temporary depression of hearing which results from one working-day exposure to noise and from which full recovery takes place before the next working day begins.

Persisting or permanent hearing loss is that amount of hearing loss, always of the nerve type, which occurs after exposure to hazardous noise levels for prolonged periods of time, usually months or years. This type of hearing

loss is irreversible and shows no change regardless of how long the individual is removed from his noisy environment.

Answer: HALLOWELL DAVIS, M.D.
Director of Research
Central Institute for the Deaf

The terms *transient hearing loss* and *persistent hearing loss* are used in the context of Conservation of Hearing in Noise to describe the hearing losses that are encountered following exposure to noise. When these losses are first observed it is not possible to predict the extent to which they are permanent. A permanent or presumably permanent loss is one that has remained stable for a length of time sufficient to be a valid basis for the payment of a compensation claim for hearing disability. A persistent hearing loss, however, is not necessarily permanent; it is one that lasts long enough to serve as a warning that some permanent loss is probable. The transient hearing loss or temporary threshold shift that follows exposure to noise passes off within a few hours, and, for the practical purposes of monitoring audiometry, a hearing loss should be considered "persistent" if it lasts for forty hours or more. This is the definition adopted implicitly in the regulation (160-3) concerning Conservation of Hearing that was recently adopted by the U. S. Air Force. A persistent loss is *potentially* permanent, and, if severe enough, it justifies reduction of noise exposure or, at the very least, expert diagnostic procedures, so that further exposure is undertaken only as a calculated risk.

FINANCIAL REPORT

Annual Audit for Calendar Year — 1956

March 26, 1957

American Academy of
Ophthalmology and Otolaryngology
Rochester, Minnesota

Gentlemen:

We have examined the balance sheet of the American Academy of Ophthalmology and Otolaryngology, an unincorporated association, Rochester, Minnesota, as of December 31, 1956, and the related statements of operations and net worth for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances. We submit herewith our report, which includes the following statements:

Exhibit

A—Balance Sheet as at December 31, 1956
B—Statement of Operations, Year ended December 31, 1956
C—Analysis of Funds from Special Contributions
D—Analysis of Net Worth Account
E—Analysis of Decrease in Market Value of Securities

Schedule

1—Securities owned, December 31, 1956

FINANCIAL CONDITION

A balance sheet as at December 31, 1956, appears in Exhibit A. The nature of the various assets and liabilities appearing on this balance sheet is described in the following comments.

Current Assets, $52,377.55

Cash on deposit at the various banks, totaling $29,115.13, was verified by direct correspondence with the depositories. The funds in the Canadian bank are stated in U. S. dollars. Petty cash fund of $25.00 was verified by actual count during the course of our examination.

Membership dues receivable, in the amount of $2,416.00, consist of delinquent dues for 1956 and prior years which were verified from the records only. Other receivables, taken from the records without further verification, consist of amounts due from members and others in the sum of $2,185.97 for slides, abstracts, manuals and monographs, and $686.94 due from various firms for advertising placed in the TRANSACTIONS.

The inventory of abstracts, manuals and monographs, Bound Volumes, slides and film strips, in the amount of $17,941.51, was taken from the inventory records as prepared by employees of the Academy without further verification except for testing of prices, extensions and footings. The major portion of this inventory is held by the Academy's printer at Omaha, Nebraska, shipments being made as directed by the Academy.

Investments, $247,418.69

In Schedule 1, we present a schedule of bonds and stocks which had a market value of $247,418.69 on December 31, 1956. U. S. Savings Series "G" Bonds are stated at maturity values rather than at current redemption prices.

Securities in the Education Fund, which are held for safekeeping by the Trust Department of the First National Bank, Minneapolis, Minnesota, were verified by communicating with the custodian of these securities. Interest earned on bonds since the dates on which last payments became due has not been accrued. An analysis of the decrease in the market value of these investments since acquisition is shown in Exhibit E.

Fixed Assets, $104,761.20

Furniture and equipment, amounting to $13,276.72, represents equipment acquired by the Academy over a period of years. Equipment acquired in years prior to September 1, 1942, which had been charged to operating expenses as purchased, was inventoried and appraised at a market value of $1,420.28 as of January 1, 1944, and set up on the books for that amount. Subsequent purchases of equipment have been verified through an examination of supporting vouchers. New equipment purchased during the current year amounted to $766.04. Depreciation has been deducted and charged to operations at a rate that appears to be adequate.

Expenditures for motion picture films and slides, entitled "Embryology of the Eye," totaling $40,900.00, and "Embryology of the Ear," with a production cost of $104,516.62, represents the cost to complete these medical motion picture films and slides by Sturgis-Grant Productions, Inc. Prints made from the master films are available for sale approximately at cost. The cost of the original films and slides is being amortized at a rate that appears to be adequate.

Deferred Charges, $55,321.58

Prepaid expenses, in the amount of $1,711.76, includes down payments of $1,000.00 for twenty-four (24) sets of color prints and slides to be used for the Embryology of the Ear Album, and $711.76 for color plates to be used for a manual now in press.

Supplies, in the amount of $415.25, as inventoried by employees without further verification by us, consist of lapel buttons which are awarded to Senior Fellows.

Unexpired insurance premiums as computed by us amounted to $102.04.

Prepaid postage deposit of $181.95, verified by correspondence, represents the balance of cash advanced to the U. S. Post Office at Omaha, Nebraska, to be used as postage on subsequent mailings of the TRANSACTIONS and supplements.

Prepaid expenses totaling $37,066.06 for the publication of the Atlas of Otolaryngic Pathology represents the balance of cost still refundable from future sales of the Atlas, for which the American Registries of Pathology is the distributor. The original expenditure by the American Academy of Ophthalmology and Otolaryngology totaled $46,629.72, and this amount has been reduced during the current year by $9,563.66 from sales of the Atlas, leaving the balance $37,055.06, as stated above.

The "Atlas of Slit-Lamp Gonioscopy" is a similar publication being sponsored by the Academy with total expenditures to date amounting to $15,844.52. Arrangements for publication and distribution of this Atlas have not been completed.

Current Liabilities, $37,101.46

Accrued expenses of $32,194.16 represents unpaid December 1956 printing costs of the TRANSACTIONS, cost of manuals and plaques, and sundry expenses, totaling $5,915.39; convention expenses incurred in connection with the annual meeting of the Academy held at Chicago in October 1956 amounting to $25,588.70; and other office expenses totaling $690.07.

Accrued social security and withholding taxes unpaid as of December 31, 1956, amounted to $686.30.

Prepayments for Bound Volumes, etc., totaling $4,076.00, consists of deposits made by members and others for Bound Volumes and various periodicals to be delivered in 1957.

Deferred income, membership dues, totaling $145.00, represents dues paid in advance by Academy members.

Undisbursed Funds from Special Contributions, $5,724.05

Undisbursed funds from contributions received and designated for "Specific Projects" are analyzed in Exhibit C, which shows 1956 transactions as well as prior year balances.

Net Worth, $417,053.51

As shown in Exhibit D, the net worth of the Academy increased from $387,888.43 on December 31, 1955, to $417,053.51 on December 31, 1956. This increase of $29,165.08 resulted from a profit of $36,650.63 from operations, as shown in Exhibit B, less a decrease in the market value of securities, in 1956, of $7,485.55, as shown in Exhibit E.

OPERATIONS

A statement of operations for the year ended December 31, 1956, is presented in Exhibit B. A summary of this statement and a comparison with the results for the year 1955 is as follows: [See accompanying table, page 430.]

GENERAL

Upon examination of the insurance in force, we found fire and extended coverage on furniture, equipment and supplies in the amount of $7,500.00 with 80% co-insurance. Bound Volumes, manuals and abstracts in custody of the printer at Omaha, Nebraska, are insured for $18,000.00 with 80% co-insurance.

Comprehensive general liability insurance is in force, covering bodily injury in the amount of $25,000.00 for each person and $25,000.00 for each accident. This coverage increases to $100,000.00 for each person and $300,000.00 for each accident during the coming 1957 annual convention at the Palmer House, Chicago, Illinois.

Property damage liability is covered in the amount of $5,000.00 for each accident with aggregate total coverages of $25,000.00.

Workmen's compensation insurance, which is being carried at the statutory amounts, includes coverage for the additional help hired at the annual convention.

	Year 1956	*Year* 1955	*Increase* **Decrease**
Revenues	$272,934.91	$257,538.66	$ 15,396.25
Operating Expenses:			
General administrative	75,922.73	65,396.77	10,525.96
Education Fund	14,900.57	11,894.74	3,005.83
Home Study Courses	7,745.83	7,691.49	54.34
Convention expenses	55,484.44	52,471.57	3,012.87
TRANSACTIONS	82,450.71	60,887.25	21,563.46
Total operating expenses	236,504.28	198,341.82	38,162.46
Operating Income	36,430.63	59,196.84	**22,766.21**
Other Income:			
Gain, sale of equipment	220.00	35.00	185.00
Total	36,650.63	59,231.84	**22,581.21**
Other Deductions:			
Loss, worthless securities		4,979.60	4,979.60
Net Income	$ 36,650.63	$ 54,252.24	**$17,601.61**

The Executive Secretary-Treasurer of the Academy is bonded for $25,000.00 and the manuscript editor for $2,500.00. Other principal office employees are bonded for $1,000.00 each, which, in our opinion, is inadequate for those individuals who handle large amounts of cash, especially at convention time.

A broad-form policy is being carried covering the "destruction or disappearance" of money, securities and other property up to $2,400.00 within the premises from robbery, burglary or mysterious disappearance, and $2,100.00 outside the premises when conveyed by a messenger. At the annual convention the coverage for loss within the premises on money and securities and other property is increased to $40,000.00, with a limit of $20,000.00 on money.

We acknowledge the very courteous assistance extended us by Dr. W. L. Benedict, Executive Secretary-Treasurer of the Academy, and his office staff during the progress of this examination.

OPINION

In our opinion, subject to the comments in the preceding paragraphs, the accompanying balance sheet and related statements of operations and net worth present fairly the financial position of the American Academy of Ophthalmology and Otolaryngology at December 31, 1956, and the results of its operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Respectfully submitted,
BYERS, WOBSCHALL & MILLER
Certified Public Accountants
By Edw. A. Wobschall, C.P.A.

EXHIBIT A

AMERICAN ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

Balance Sheet as at December 31, 1956

ASSETS

Current Assets:			
Cash, First National Bank, Rochester, Minnesota		$ 25,645.30	
Cash, First National Bank, Minneapolis, Minnesota		1,851.32	
Cash, Bank of Montreal, Toronto, Canada		1,618.51	
Petty cash fund		25.00	
Membership dues receivable, delinquent		2,416.00	
Accounts receivable, other		2,872.91	
Check held for collection		7.00	
Inventory, abstracts, manuals, films		17,941.51	
Total current assets			$ 52,377.55
Investments: (Schedule 1)			
Bonds and stocks			247,418.69
Fixed Assets:			
Furniture and equipment	$ 13,276.72		
Less reserve for depreciation	7,813.70	5,463.02	
Embryology of the Eye, film & slides	40,900.00		
Less reserve for depreciation	28,210.00	12,690.00	
Embryology of the Ear, film & slides	104,516.62		
Less reserve for depreciation	17,908.44	86,608.18	
Total net value, fixed assets			104,761.20
Deferred Charges:			
Prepaid expenses		1,711.76	
Supplies		415.25	
Prepaid insurance		102.04	
Prepaid postage		181.95	
Atlas of Otolaryngic Pathology		37,066.06	
Atlas of Slit-Lamp Gonioscopy		15,844.52	
Total deferred charges			55,321.58
Total Assets			$459,879.02

LIABILITIES AND NET WORTH

Current Liabilities:		
Accrued expenses	$ 32,194.16	
Accrued payroll taxes	686.30	
Prepayments for Bound Volumes, etc.	4,076.00	
Deferred income, membership dues	145.00	
Total current liabilities		$ 37,101.46
Undisbursed Funds from Special Contributions: (Exhibit C)		
Wherry Memorial Fund		5,724.05
Net Worth (Exhibit D)		417,053.51
Total Liabilities and Net Worth *		$459,879.02

* Subject to report comments

EXHIBIT B

AMERICAN ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

Statement of Operations, Year Ended December 31, 1956

Revenues:			
Membership dues			$ 69,193.00
Membership applications			5,076.00
Abstracts, manuals and monographs			7,691.25
Certificates			1,239.50
Films and slides			7,117.50
Testing and calibration of tonometers			1,034.00
Royalties, Atlas and Textbook of Ophthalmic Pathology			691.20
Convention			88,505.50
Home Study Courses			8,346.00
TRANSACTIONS			74,139.22
Income from securities:			
Interest, Education Fund		$ 3,659.36	
Dividends, Education Fund		6,006.62	9,665.98
Other income			235.76
Total Revenues			272,934.91
Operating Expenses:			
General administrative		75,922.73	
Educational Fund:			
Trustee fees	$ 166.63		
Depreciation, films and slides	14,433.94		
Embryology of Ear: Album	300.00	14,900.57	
Home Study Courses		7,745.83	
Convention expenses		55,484.44	
TRANSACTIONS		82,450.71	
Total Operating Expenses			236,504.28
Operating Income			36,430.63
Other Income:			
Gain on sale of equipment			220.00
Net Income			$ 36,650.63

EXHIBIT C

AMERICAN ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

Analysis of Funds from Special Contributions

WHERRY MEMORIAL FUND	
Balance, December 31, 1955	$ 5,521.16
Receipts, Year 1956:	
Dividends	202.89
Balance, December 31, 1956	$ 5,724.05
SUB-COMMITTEE ON NOISE IN INDUSTRY FUND	
Balance, December 31, 1955	None
Receipts, Year 1956:	
Contributions received from outside sources	$ 72,306.37
Total	72,306.37
Less:	
Transfers to Sub-Committee on Noise in Industry, Los Angeles, California *	72,306.37
Balance, December 31, 1956	None

* This amount was received by the Academy and paid to the Sub-Committee on Noise in Industry as shown in audit report (not certified) submitted to the Academy by the Sub-Committee. The Sub-Committee has an unexpended balance of $12,397.60, which is not shown on the balance sheet marked Exhibit A in this report.

EXHIBIT D

AMERICAN ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

Analysis of Net Worth Account, for Year Ended December 31, 1956

Net Worth, December 31, 1955	$387,888.43
Addition, Year 1956:	
Net income, year ended December 31, 1956 (Exhibit B)	36,650.63
	424,539.06
Deduction, Year 1956:	
Decrease in market value of securities during 1956 (Exhibit E)	7,485.55
Net Worth, December 31, 1956	$417,053.51

EXHIBIT E

Analysis of Decrease in Market Values of Securities

	Cost	*Market Value*	*Increase* **Decrease**
December 31, 1955 (audit report)	$187,467.34	$223,843.60	$ 36,376.26
December 31, 1956 (Schedule 1)	218,527.98	247,418.69	28,890.71
Difference	$ 31,060.64	$ 23,575.09	**7,485.55**

SCHEDULE 1

American Academy of Ophthalmology and Otolaryngology Securities Owned, December 31, 1956

EDUCATIONAL FUND

BONDS	RATE %	MATURITY	PAR VALUE	COST		MARKET VALUE (*)
Citizens Building Co. of Cleveland, 1st Leasehold Sinking Fund	6	1/ 1/46	$ 5,000.00	None	(1)	None
Van Sweringen Co. Certificates of Indebtedness, Series 1925	6	12/31/48	6,000.00	$ 1,257.03	(2)	$ 480.00
Dominion of Canada, 8th Victory Loan Series P5	3	10/ 1/63	7,500.00	7,612.50	(3)	7,115.63
Dominion of Canada, 9th Victory Loan Series P7	3	9/ 1/66	2,000.00	1,880.00	(3)	1,887.50
Government of Canada	3¼	10/ 1/79	3,500.00	3,629.84	(3)	3,276.87
Government of Canada	3¼	10/ 1/79	2,000.00	1,982.50	(3)	1,872.50
U. S. Savings Series G	2½	7/ 1/58	30,000.00	30,000.00	(*)	30,000.00
U. S. Savings Series G	2½	12/ 1/58	25,000.00	25,000.00	(*)	25,000.00
U. S. Savings Series G	2½	3/ 1/59	15,000.00	15,000.00	(*)	15,000.00
U. S. Savings Series G	2½	7/ 1/60	30,000.00	30,000.00	(*)	30,000.00
Total Bonds				$116,361.87		$114,632.50

STOCKS	KIND	PAR VALUE	SHARES			
Citizens Building Co. of Cleveland	Shares	No par	50	None		None
Commonwealth Edison Co.	Common	$ 25.00	100	$ 2,294.56		$ 3,912.50
E. I. du Pont de Nemours & Co. ..	Common	5.00	60	2,347.31		11,565.00
Massachusetts Investors Trust ...	Trust Certif. B/1	.33	3,888	19,653.50		45,411.84
Ophthalmic Publishing Co.	Capital	20.00	5	None		100.00
Northern Illinois Gas Co.	Common	5.00	34	401.44		607.75
Central Maine Power Co.	Common	10.00	200	5,225.00		4,250.00
Incorporated Investors	Capital	1.00	1,000	9,345.00		9,890.00
Investors Syndicate of Canada ...	Common A	.25	100	1,439.05		1,325.00
Investors Diversified Services	Common A	1.00	100	6,785.95		6,300.00
Bank of America Nat'l Trust & Savings Assn.	Common	6.25	100	3,950.00		3,850.00
Weco Products Co.	Common	1.00	300	4,125.00		3,000.00
Anchor Casualty Co.	Pre.—1.75 Cum.	10.00	100	4,075.00		3,900.00
Louisville Gas & Electric Co.	5% Preferred	25.00	200	5,450.00		5,600.00
Incorporated Income Fund	Capital	1.00	3,170	31,674.30		27,674.10
Total Stocks				$ 96,766.11		$127,386.19
TOTAL EDUCATIONAL FUND				$213,127.98		$242,018.69

WHERRY MEMORIAL FUND	KIND	PAR VALUE	SHARES			
Rochester Building & Loan Assn.	Capital	$100.00	54	5,400.00		5,400.00
TOTAL INVESTMENTS ...				$218,527.98		$247,418.69

(*) Except for U. S. A. Savings Series G Bonds, which are included at maturity values

(1) Charged off in 1955. No market available

(2) In process of liquidation

(3) In U. S. dollars

THE INTERNATIONAL ASSOCIATION OF SECRETARIES OF OPHTHALMOLOGICAL AND OTOLARYNGOLOGICAL SOCIETIES

Present Direction and Future Aims

SINCE the October 1956 meeting of the American Academy of Ophthalmology and Otolaryngology marked the sixteenth anniversary of the International Association of Secretaries of Ophthalmological and Otolaryngological Societies, it might be an appropriate time to glance back over the years and see the development of this association and to take stock of the plans in progress for future development.

Like all auxiliary groups, the International Association of Secretaries of Ophthalmological and Otolaryngological Societies has a primary aim: the best possible progress of its parent organization, the American Academy of Ophthalmology and Otolaryngology. When the Secretaries' Society was formed in 1939, it was just a national group to which all secretaries of all state and local societies were invited to participate. Since these doctors, as secretaries, had the responsibility of correspondence, within and without their own groups, it was felt that a closer communication between them, a yearly opportunity to discuss their problems of organization, and an invaluable opportunity to exchange pertinent information regarding such matters as types of programs and available speakers would make for better societies on all levels of organization.

The dissemination of information between secretaries proved such an invaluable means of keeping in touch with the national situation that in 1950 the secretaries voted to enlarge their activities to include their good neighbors, and the society became the Pan-American Association of Secretaries of Ophthalmological and Otolaryngological Societies. Now information of scientific meetings in the countries close by could be sent out quickly and easily through the chain of secretaries, and the feeling of being in constant touch with our neighbors, not just at the annual meeting in Chicago but throughout the year, had a beneficial effect in increasing a sympathetic understanding of problems on a much broader scale.

Four years ago, in 1952, the logical progression to the International Association of Secretaries of Ophthalmological and Otolaryngological Societies came. In its sixteenth year the Association now has 100 secretaries in 43 foreign countries, and 150 in the United States. One striking example of the mutual feelings of warmth engendered by the enlarging of the society to international scope has been the invitation extended by the Sixth International Congress of Otolaryngology to serve as hosts in the Hospitality Lounge. Many of the secretaries will be greeting not "strangers from a strange land" but old friends with whom they have shared ideas and problems through correspondence.

On the national level, the association has greatly facilitated the exchange of information about local, state, and national meetings between interested members of local societies. The international directory of both Ophthalmology and Otolaryngology can be kept more correct and current through the use of the ten district organizations of the secretaries. In past years, at the request of the Program Committee of the Academy, a comprehensive survey on instruction courses has been conducted by the Association. The compilation of this

survey, giving comments on the subject matter and presentation of the courses, together with suggestions as to how the courses could be improved, has proved to be of value not only to the Academy but also to the secretaries, as it automatically makes them acquainted with a wide list of speakers and subjects.

It is almost impossible to estimate the future possibilities of the Association. As the secretaries bring new ideas back into their local societies and through their contacts promote more successful local and state meetings in their specialties, these groups in turn can make a stronger contribution to the national and international groups. The correspondence carried on with the secretaries in foreign countries cannot but increase in scope and size.

Among steps toward better foreign relations voted on in the October 1956 meeting are (1) a service in making arrangements for registration of distinguished ophthalmologists and otolaryngologists traveling in the Asia-Pacific area so that they can be available for scientific presentations at society meetings in the countries they visit, and (2) a mailing service of translated reprints for the foreign countries represented in the Association. The Association also offered its cooperation in helping arrange for well-trained young physicians from Asia to spend one or more years in resident training in Ophthalmology and Otolaryngology in the United States. A letter to President Eisenhower concerning some of these foreign connections received a prompt reply from the Department of State, calling the attention of the Association to the International Educational Exchange program and discussing other possibilities which will be submitted to the Council.

President Willard Goff has called the Association a "two-way street." It exists not only to facilitate the work and improve the scope of its own secretary members but, by correlating their work, to make a worth-while contribution and increase their value to their parent organization, the American Academy of Ophthalmology and Otolaryngology. The Association is enthusiastic and receptive to new ideas. Help your secretary to help you by letting him know your ideas.

ROLAND H. MYERS, M.D.
Active Director

Asia-Pacific Academy of Ophthalmology

At the 1956 annual meeting, the International Association of Secretaries of Ophthalmological and Otolaryngological Societies approved the following recommendations which I had placed before them:

1. To support the formation of an Asia-Pacific Academy of Ophthalmology
2. To encourage teachers of ophthalmology traveling to Asia to contact local societies and address them
3. To bring well-trained young physicians from Asia for residency training programs in ophthalmology to the United States

I am pleased to report that several of these recommendations have now been carried out.

The Governor of Hawaii, on February 20, 1957, granted a charter of incorporation to this Academy. The Treasurer of the Territory of Hawaii accepted and filed the bylaws of this Academy in accordance with the laws of the Territory of Hawaii on March 7, 1957. Interest in and cooperation with the plans and ideals of this Academy have been assured from oculists residing in India, Pakistan, Japan, Korea, Hong Kong, the Philippines, Indonesia, and Thailand.

Applications have been received from oculists in Asia for further training in the United States.

It seems to me that the future of this Academy will, to a large extent, depend on the continued interest and enthusiasm which it arouses in the Americas, Asia, Australia, and elsewhere in the world. This can come about only through the awareness of ophthalmologists of the existence, ideals, and purposes of the Academy.

During the summer of 1956 I discussed the plan with oculists in Korea, Japan, Okinawa, Formosa, Hong Kong, Singapore, Australia, New Zealand, and the Fiji Islands. In the spring of 1957 Dr. Archie Cruthirds, President of the International Association of Secretaries of Ophthalmological and Otolaryngological Societies, presented the plan to ophthalmologists in Pakistan, India, Bangkok, and the Philippines. From the response received to date, it appears that ophthalmologists in the Eastern Hemisphere are pleased with the possibility of availing themselves of continued postgraduate medical education and the exchange of scientific information.

The next step should be to apprise ophthalmologists in the Americas of our efforts. They, too, could benefit from affiliation with this Academy. Should they travel to Asia, they could add to the enjoyment of their own trip and create much good will abroad by meeting with and talking to ophthalmologic societies there. Should they desire to get further practice in eye surgery, facilities are available in certain parts of Asia to do so. Should they be interested in tropical medicine, teaching, or research through the facilities of the Academy, this can be readily accomplished. Should they need interns and residents for their eye services, they could tap an almost unlimited pool of young, eager, well-trained graduates of Asian universities.

With this in mind, I recommend that arrangements be made at the 1957 meeting of the American Academy of Ophthalmology and Otolaryngology in Chicago to present a talk on the aims, purposes, and scope of the Asia-Pacific Academy.

The confidence and approval of the Association of Secretaries last year and Dr. Cruthirds' arduous trips and many talks to various Asian groups, as well as my own efforts in the past, will be justified if other oculists in the Americas get behind and help the Asia-Pacific Academy of Ophthalmology.

WILLIAM JOHN HOLMES, M.D.
Director
The International Association of Secretaries of Ophthalmological and Otolaryngological Societies

Meetings

THE OPHTHALMOLOGICAL AND OTOLARYNGOLOGICAL SOCIETY OF ALBERTA

April 26 and 27, 1958; Calgary, Alberta, Canada.

OPHTHALMOLOGICAL SOCIETY OF AUSTRALIA

Week of Monday, September 30, 1957; Melbourne, Victoria.

October 6-12, 1958; Adelaide, South Australia.

BELGIAN OPHTHALMOLOGICAL SOCIETY

November 24, 1957; Boulevard de Waterloo, no. 54, Brussels.

DEUTSCHE OPHTHALMOLOGISCHE GESELLSCHAFT HEIDELBERG

September 8-12, 1957; University Building, Heidelberg, Germany.

FRENCH OPHTHALMOLOGICAL SOCIETY

1958—Drs. DeJean, Leplat and Hervouet, "Embryology of the Eye."
1959—Dr. François, "Congenital Cataracts."
1960—Dr. Nataf, "Virus Infection of the Eye."
1961—Dr. Ourgaud, "Functional Examination of Glaucoma."

MONTREAL OPHTHALMOLOGICAL SOCIETY

October 10, 1957—Royal Victoria Hospital
December 12, 1957—Notre Dame Hospital
February 13, 1958—Montreal General Hospital
April 10, 1958—Hotel Dieu Hospital

OPHTHALMOLOGICAL SOCIETY OF NEW ZEALAND

October 15, 16, 17 and 18, 1957; Hamilton, New Zealand.

OXFORD OPHTHALMOLOGICAL CONGRESS

July 7, 8 and 9, 1958; Oxford, England.

VIENNA OPHTHALMOLOGICAL SOCIETY

The Vienna Ophthalmological Society meets the second Monday of every month except February, July, August, and September. The future sessions are scheduled for:

1957—October 10, November 11, December 9.
1958—January 13, March 10, April 14, May 12, June 9.

BOOK REVIEW

SPEECH CORRECTION AT HOME— By Morris V. Jones. Charles C Thomas, Springfield, Illinois, 1957, 138 pp.

Instructing the relatives of the individual with a speech problem is a major responsibility of the speech therapist. There has been little written material about such instruction and Dr. Jones' book will help fill this need. The book gives only enough theory to make each of the speech problems understood, but it is primarily devoted to practical suggestions and exercises.

In general, the rationale for the suggested speech therapy is good, though some speech therapists might disagree with a few of the specific techniques proposed. In this reviewer's mind, there is some question of the wisdom of the do-it-yourself psychotherapy suggested for stutterers. The reviewer is especially grateful for the helpful hints to parents given in the chapters "Your Child Learns to Talk" and "If Your Child Can't Talk," as well as for the chapter which contains valuable suggestions for relatives of aphasics.

In summary, this is a readable book which is written primarily for relatives and teachers of individuals with speech problems and is filled with practical suggestions. This is a book for physicians to recommend if their patients need more instruction along these lines.

J. M. S.

RECAPITULATION OF GENERAL INSTRUCTIONS

1. Monday, Tuesday, Wednesday, and Thursday are represented by the letters M, T, W, Th. The first period in the morning is represented by figure 1, second period by figure 2 and third period by figure 3. The first period in the afternoon is represented by figure 4, second period by figure 5, and third period by figure 6. All courses in otolaryngology and maxillofacial surgery are presented in the mornings. All courses in ophthalmology are presented in the afternoons.

2. Reservation of instruction tickets in advance of the meeting will be made ONLY for MEMBERS whose 1957 dues have been paid. Academy candidates and guests may make selection of courses ONLY at the General Registration Desk in Chicago.

3. Make check payable to W. L. Benedict, M.D.

4. Mail order promptly to ensure reservation of first choices. If necessary, an attempt will be made to rearrange schedule to include "first choices."

(Over)

SELECTION OF COURSES

PERIOD		FIRST CHOICE		SECOND CHOICE		THIRD CHOICE	
		Course No.	Lecturer	Course No.	Lecturer	Course No.	Lecturer
MON.	4						
P.M.	5						
	6						
TUES.	1						
A.M.	2						
	3						
P.M.	4						
	5						
	6						
WED.	1						
A.M.	2						
	3						
P.M.	4						
	5						
	6						
THURS.	1						
A.M.	2						
	3						
P.M.	4						
	5						
	6						

SECTION ON INSTRUCTION

ADVANCE ORDER SHEET

All courses cost $2.00 for each period (one hour). Follow instructions explicitly and check for errors in listing before mailing.

Orders will not be accepted for presale after October 3. To ensure acceptance they should be mailed before September 30 to

WILLIAM L. BENEDICT, M.D., *Executive Secretary-Treasurer*
American Academy of Ophthalmology and Otolaryngology
15 Second Street S.W., Rochester, Minnesota

Academy Candidates and Guests May Purchase Tickets Only at Instruction Desk in Registration Foyer

(Over)

ADVANCE ORDER SHEET

ORDERS FILLED ONLY IF CURRENT DUES ARE PAID

NO REFUNDS WILL BE MADE AFTER OCTOBER 11

(Type or Print) Last Name First Name Middle Initial

Office Address

City Zone State

Days to be Present

- ☐ Monday
- ☐ Tuesday
- ☐ Wednesday
- ☐ Thursday

Total Amount Enclosed $_____

SELECTION OF COURSES ON REVERSE SIDE OF THIS BLANK

News - - - Notes

PAN-AMERICAN ASSOCIATION OF OPHTHALMOLOGY

The Second Cruise Congress of the Pan-American Association of Ophthalmology will take place on the Queen of Bermuda, leaving New York on February 1, and returning to New York on February 14, 1958. The Second Cruise Congress is a bona fide interim meeting sponsored by the Pan-American Association and will be conducted similarly to previous interim congresses. The scientific program will consist of lectures, demonstrations, papers, and motion pictures of surgical and technical procedures. Several commercial firms have expressed an interest in the cruise and have inquired about technical exhibit space.

The social program is now in preparation. In addition to meetings aboard the boat, there will be an opportunity to see the eye, ear, nose, and throat hospitals and to meet the staffs of medical schools in the island ports.

Over 300 registrations have been received, and the list is growing larger every week. On June 1, there were available just 40 conventional rooms, six deluxe rooms, and two suites above Deck E. Since the unclaimed cabins cannot be held indefinitely, members of the Congress and prospective members are urged to write immediately to the official travel agent, Mr. Leon V. Arnold, 33 Washington Square West, New York 11.

Membership in the Cruise Congress of the Pan-American Association of Ophthalmology is contingent upon registration with, and the purchase of Cruise tickets through, Mr. Arnold. Registrations for the Congress are automatically made when orders for ship reservations are received by Mr. Arnold. The fee for registration and entertainment is included in the ticket purchase price.

Application has been made to the U. S. Treasury Department to have the Congress listed as an educational meeting for purposes of deduction from reportable income for tax estimation.

COUNCIL ON INDUSTRIAL HEALTH, A.M.A.

The Council on Industrial Health, American Medical Association, is pleased to announce the completion of its new Committee on Industrial Ophthalmology. Members of the Committee are Edmund B. Spaeth, M.D., chairman, Philadelphia; Edmond L. Cooper, M.D., Detroit; Ralph S. McLaughlin, M.D., Laconia, N. H.; Joseph F. Novak, M.D., Pittsburgh, and Ralph W. Ryan, M.D., Morgantown, W. Va.

The first meeting of the Committee was held in New York City, June 7, in conjunction with the annual convention of the American Medical Association.

COLORADO

The Colorado Ophthalmological Society and the Office of Postgraduate Medical Education, University of Colorado School of Medicine, are co-sponsors of a Postgraduate Course in Ophthalmology to be given July 22-25, 1957, at the University of Colorado School of Medicine, concurrently with the Summer Convention of the Colorado Ophthalmological Society.

The four-day course will consist of a symposium on "Glaucoma" and lectures on "Refraction and Optical Aids in Reduced Vision." Lecturers for the symposium will be Doctors Robert N. Shaffer, Robert A. Schimek, and H. Saul Sugar. Dr. Arthur Linksz will conduct the other lectures.

Registration will be open to all members of the Colorado Ophthalmological Society and other qualified physicians on a limited membership basis. The registration fee is $5.00, and the tuition fee is $45.00.

Applications, together with the $50.00 fee, should be sent to the University of Colorado Medical Center, Office of Postgraduate Medical Education, 4200 East Ninth Avenue, Denver 20.

ILLINOIS

The Chicago Ophthalmological Society and the Institute of Medicine of Chicago held a joint meeting on May 20, 1957, at the Drake Hotel, Chicago. The Edward Lorenzo Holmes Memorial Lecture was delivered by Dr. Irving H. Leopold, M.D., professor and chairman of the Department of Ophthalmology, University of Pennsylvania. His subject was "Therapy of Vascular Diseases of the Fundus."

PENNSYLVANIA

Dr. Edward J. Donnelly has been appointed attending surgeon at Wills Eye Hospital, Philadelphia. He has been a member of the staff for twenty-five years. He is also active consultant in Ophthalmology at St. Vincent's Hospital and at Philadelphia General Hospital, and assistant professor of clinical ophthalmology at Jefferson Medical College.

Dr. Donnelly is an alumnus of St. Joseph's College and received his medical degree from Jefferson Medical College. He is a diplomate of the American Board of Ophthalmology; a fellow of the American Academy of Ophthalmology and Otolaryngology, the American College of Surgeons, the International College of Surgeons, the College of Physicians of Philadelphia, and the Pennsylvania Academy of Ophthalmology and Otolaryngology; and a member of the American Medical Association, the Philadelphia County Medical Society, the Ophthalmic Club of Philadelphia, and the Medical Club of Philadelphia.

WASHINGTON, D. C.

Dr. John M. Orem, president of the Board of Trustees of Sibley Memorial Hospital, Washington, D. C., has announced establishment of two new departments for the proposed new Sibley Hospital, for which a $1,500,000 fund drive is now under way.

The two new units, not originally contemplated in building plans, are a Department of Ophthalmology under Dr. William M. Hart, of Bethesda, Maryland, and a Department of Psychiatry under Dr. Zigmond M. Lebensohn, of Washington, D. C.

Sibley Memorial Hospital, which will be a 350-bed hospital and has become an integral part of the American University, at Nebraska and Massachusetts Avenues, will designate the entire seventh floor of its new building to the two projected units.

Dr. Hart's eye-treatment section will have 30 beds, plus a clinic for out-patients. The arrangement will make possible a training program for eye surgeons. Dr. Hart is an associate professor at Georgetown University and consultant in ophthalmology at Walter Reed Army Institute of Research.

Dr. Lebensohn's unit will have 28 beds, according to present plans. A practicing psychiatrist and former Navy medical officer, Dr. Lebensohn hopes to offer special treatment for adolescents' problems and pastoral training in psychiatry for local clergymen.

CANADA

Mr. A. J. B. Goldsmith, F.R.C.S., has been appointed visiting professor of ophthalmology at the University of Toronto for the month of May, 1957, as exchange lecturer from the Middlesex Hospital, London, England.

POSITIONS AVAILABLE

OPHTHALMOLOGIST wanted to associate in private practice and part-time university teaching and investigative work. Position available immediately for well-qualified young Diplomate. Prefer family man with more than minimal qualifications. For further details, please write Arthur H. Kenney, M.D., Heyburn Bldg., Louisville 2, Ky.

Senior residency available in OPHTHALMOLOGY, with affiliated children's training. Stipend, $3,550; vacancy, now. Contact R. H. Lehman, M.D., Chief, Ophthalmology Section, Veterans Administration Center, Wood, Wis.

OPHTHALMOLOGIST: Board man in Washington, D. C., desires associate to alternate in two fully-equipped eye offices. Offers extensive experience in industrial eye injuries, consultation work, neuro-ophthalmology, all types of eye pathology, and major surgery; $15,000.00 to $17,000.00 to start, with ultimate partnership arrangement. Write to C. Last, 4101 Underwood Street, University Park, West Hyattsville, Md.

The Department of Surgery, Division of Ophthalmology of the State University of New York, is in a position to offer a four-year FELLOWSHIP IN OPHTHALMOLOGY to start September 1, 1957. The period of training will be supported by a grant from the United States Public Health Service. The applicant must be a citizen of the United States. The recipient must plan to continue his teaching and research after completing his training. Those interested, please contact Dr. Richard C. Troutman, Professor of Ophthalmology, State University of New York, 451 Clarkson Ave., Brooklyn, New York. Telephone, Ingersoll 2-4000, extension 343.

OTOLARYNGOLOGIST wanted. Prefer Board-certified or eligible. Associate with otolaryngologist and ophthalmologist, now building new EENT clinic. Opportunity to do all phases of ENT work. Salary open. Opportunity for partnership. For further details write to J. B. Gregg, M.D., 1600 S. Western Ave., Sioux Falls, S. D.

The office and equipment of the late Dr. S. Condit Glasgow (EENT), 600 South Main Street, Salinas, California, is to be sold. Anyone interested in purchasing the office and equipment should write Mr. Paul Pioda, Salinas, California.

Listings of positions available should be sent to W. L. Benedict, M.D., 15 Second St. S.W., Rochester, Minn., by the fifth of the month preceding publication. They should include (1) type of physician wanted (ophthalmologist or otolaryngologist; diplomate, resident, etc.); (2) type of position to be filled; and (3) whom to write for further information. Unless otherwise requested, listings will be published once only.

The Academy will handle no further correspondence beyond the listing and assume no responsibility. Neither does it endorse nor guarantee any of the published listings.

SECTION ON INSTRUCTION

SIXTY-SECOND ANNUAL MEETING

American Academy of Ophthalmology and Otolaryngology

October 13-18, 1957

PALMER HOUSE

Chicago, Illinois

A. D. RUEDEMANN, M.D.
Secretary for Instruction — Ophthalmology

DEAN M. LIERLE, M.D.
Secretary for Instruction — Otolaryngology and Maxillofacial Surgery

The following condensed schedules of instruction courses are reprinted for the convenience of Fellows who have not yet placed orders for tickets.

Courses already sold out are so designated on the charts. Please do not request tickets for these courses.

For complete listing of course titles, instructors, and descriptive paragraphs about each subject, please refer to the March-April issue of the TRANSACTIONS.

General Instructions

Only members who have paid their 1957 *dues may order instruction tickets in advance of the meeting.* Members should order tickets only for their own use. Candidates for fellowship in the Academy are not privileged to reserve tickets in advance. After the session opens, no distinction between members, candidates and guests will be made in selling tickets.

Each period (1 hour) of instruction costs $2.00. *Orders unaccompanied by properly executed checks will not be filled.* Checks should be made payable to W. L. Benedict, M.D.

In case of inability to attend the meeting after order has been filled, a refund will be granted if requested prior to October 11.

If courses requested are not available and it is impossible to substitute, a refund will be granted. Refunds will not be sent by mail. A blue refund card will be placed in the Advance Registration Envelope which is received at the time of registration. This should be presented at the Instruction Desk for payment.

All orders for tickets will be filled according to postmark on envelope containing check. Telegrams will not be honored. Orders will not be accepted for presale after October 3. To ensure acceptance they should be mailed by September 30 to William L. Benedict, M.D., 15 Second Street S.W., Rochester, Minnesota.

Ordering Instruction Tickets

An *individual* course is complete in one (1) period. Most individual courses are repeated on two different days, allowing the subscriber to choose the day on which he wishes to attend.

A *continuous* course runs two (2) or more periods as indicated. It is not possible to purchase a ticket to only *part* of a continuous course.

At the end of this section is printed a colored sheet to be used when ordering tickets in advance. Specify preferences on this sheet and mail to the executive office. Careful attention to instructions will ensure the correct filling of your requests. *Since number of tickets for each course is limited, be sure to list second and third choices for each period in case first choice is already sold out. In every case, effort will be made to furnish first choices.*

If you are requesting registration in the continuous courses, please specify preferences for individual courses as substitutes in order to avoid disappointment should the continuous courses which you select be sold out when your order is received.

Acknowledgment of Advance Order

As soon as an advance order is filled, a postcard, listing the courses that have been reserved for him, will be mailed to the subscriber. Please do not ask to change courses after your order has been filled. The postcard is merely an assurance that your order has been filled; it is not necessary for registration at the Academy meeting.

Claiming Instruction Tickets

No tickets will be sent through the mails. Members who have ordered instruction course tickets will register at the *Advance Order Section* of the Registration Desk during the week of the Convention to secure registration badge, tickets, and all convention material.

Tickets will be on sale during the meeting at the Instruction Desk in the Registration Foyer.

KEY TO DESIGNATION OF PERIODS

The periods will be designated with the following key: Select tickets for — Otolaryngology, forenoons, periods 1-2-3 — Ophthalmology, afternoons, periods 4-5-6

Day	(M)onday	(T)uesday	(W)ednesday	(Th)ursday
Period a.m.		1 2 3	1 2 3	1 2 3
Period p.m.	4 5 6	4 5 6	4 5 6	4 5 6

M-4	2:00 p.m. to 3:00 p.m.	W-4	2:00 p.m. to 3:00 p.m.
M-5	3:15 p.m. to 4:15 p.m.	W-5	3:15 p.m. to 4:15 p.m.
M-6	4:30 p.m. to 5:30 p.m.	W-6	4:30 p.m. to 5:30 p.m.
T-1	9:00 a.m. to 10:00 a.m.	Th-1	9:00 a.m. to 10:00 a.m.
T-2	10:15 a.m. to 11:15 a.m.	Th-2	10:15 a.m. to 11:15 a.m.
T-3	11:30 a.m. to 12:30 p.m.	Th-3	11:30 a.m. to 12:30 p.m.
T-4	2:00 p.m. to 3:00 p.m.	Th-4	2:00 p.m. to 3:00 p.m.
T-5	3:15 p.m. to 4:15 p.m.	Th-5	3:15 p.m. to 4:15 p.m.
T-6	4:30 p.m. to 5:30 p.m.	Th-6	4:30 p.m. to 5:30 p.m.
W-1	9:00 a.m. to 10:00 a.m.		
W-2	10:15 a.m. to 11:15 a.m.		
W-3	11:30 a.m. to 12:30 p.m.		

(Familiarity with this key will be helpful and will avoid confusion)

CORRECTIONS

In the Description of Courses published in the March-April issue, the periods listed for Course 45 should read Th-4, Th-5, Th-6; for Course 141, M-5. These periods are correctly stated on the accompanying schedules.

Course 511 will be presented by Dr. Myron J. Levin, Hines, Illinois, instead of by Dr. Mustafa Kemal Yon.

The following are condensed schedules of courses previously described

CONTINUOUS COURSES — OPHTHALMOLOGY

COURSE	SPEAKERS	SUBJECT	PERIODS USED
1	Adler	Physiology of Vision	3 PERIODS M-4, T-4, W-4
2	Allen et al.	Bacteriology and Infectious Diseases	8 PERIODS M-4, M-5, T-4, T-5 W-4, W-5, Th-4, Th-5
3	Ascher	Aqueous Veins in Glaucoma	2 PERIODS M-4, M-5
4	Ballintine & Johnson, L.	.....SOLD OUT.....	
5	Becker & Kinsey	Studies on Aqueous Flow	2 PERIODS T-5, T-6
6	Bedell	..... CANCELLED	
7	Berke	Surgery of Oblique Muscles	2 PERIODS M-5, M-6
8	Berliner	Recent Advances in Biomicroscopy	3 PERIODS M-6, T-6, W-6
9	Birge et al.	Vascular Diseases	2 PERIODS T-5, T-6
10	Boeder	Practical Optics	2 PERIODS M-5, M-6
11	Breinin	Electromyography	2 PERIODS W-5, W-6
12	Brockhurst	Indirect Ophthalmoscopy	2 PERIODS T-5, T-6
13	Brown, H. et al.	Eye Muscles	8 PERIODS M-4, M-5, T-4, T-5 W-4, W-5, Th-4, Th-5
14	Byrnes	Ophthalmic Filters	2 PERIODS W-5, W-6
15	Callahan et al.	Ophthalmic Plastic Surgery: Fundamental	8 PERIODS M-5, M-6, T-5, T-6 W-5, W-6, Th-5, Th-6
16	Clark, G.	Retinal Detachment	3 PERIODS M-4, T-4, W-4
17	Clark, W.	Surgery of Ocular Muscles	2 PERIODS M-4, M-5
18	Clark, W.	Cataract Extraction: Selection of Patient	2 PERIODS T-4, T-5
19 or 20	Copeland	Streak Retinoscopy	4 PERIODS M-4, M-5, T-4, T-5 or W-4, W-5, Th-4, Th-5
21	Costenbader et al.	Comitant Strabismus	12 PERIODS M-4, M-5, M-6, T-4 T-5, T-6, W-4, W-5 W-6, Th-4, Th-5, Th-6
22	Dunnington & Regan, E.	Cataract Surgery: Complications Due to Defective Wound Healing	2 PERIODS M-4, M-5
23	Fonda & Sloan	Subnormal Vision	2 PERIODS T-4, T-5
24	Guibor	Orthoptics: Office and Home Techniques	3 PERIODS M-4, T-4, W-4
25	Hollenhorst	Arterial Diseases	2 PERIODS M-4, M-5
26	Hughes et al.	Ophthalmic Plastic Surgery: Advanced	8 PERIODS M-5, M-6, T-5, T-6 W-5, W-6, Th-5, Th-6

CONTINUOUS COURSES — OPHTHALMOLOGY

COURSE	SPEAKERS	SUBJECT	PERIODS USED
27	Knighton et al.	Highlights in Glaucoma	8 PERIODS M-4, M-5, T-4, T-5 W-4, W-5, Th-4, Th-5
28	McLean et al.	Retinal Detachment	8 PERIODS M-4, M-5, T-4, T-5 W-4, W-5, Th-4, Th-5
29	Pfeiffer & Jones, I.	Roentgenography of the Eye and Orbit	2 PERIODS M-4, M-5
30	Pischel et al.	Retinal Detachment	4 PERIODS M-5, M-6, T-5, T-6
31	Regan, J. & Regan, C.	Refraction: Practical Aspects & Aids in Difficult Problems	6 PERIODS M-4, M-5, T-4, T-5 W-4, W-5
32	Rolett	Gonioscopy: Practical Application	2 PERIODS W-4, W-5
33	Romaine	Ocular Motility Surgery	4 PERIODS M-4, M-5, T-4, T-5
34	Romaine	Refraction Problems: Treatment	3 PERIODS M-6, T-6, W-6
35	Rucker	Neuro-ophthalmology	3 PERIODS M-6, T-6, W-6
36	Schimek & Bousquet	Clinical Gonioscopy & Tonography	2 PERIODS W-5, W-6
37	Sloane	School Vision Testing	2 PERIODS M-4, M-5
38	Sloane	Telescopic Lenses	2 PERIODS T-4, T-5
39	Gettes	Prescription of Prisms; Drugs in Refraction	2 PERIODS W-4, W-5
40	Steffensen & Smith, R.	Corticotropin and Synthetic Steroids	2 PERIODS T-4, T-5
41	Stow & Moss	Diagnostic & Therapeutic Office Procedures	2 PERIODS M-5, M-6
42	Theobald et al.	Histopathology	12 PERIODS M-4, M-5, M-6, T-4 T-5, T-6, W-4, W-5 W-6, Th-4, Th-5, Th-6
43	Thorpe	Surgery of Intraocular Foreign Bodies	2 PERIODS M-4, M-5
44	Thorpe et al.	Slit Lamp Biomicroscopy: Fundamentals	9 PERIODS M-4, M-5, M-6, T-4, T-5 T-6, W-4, W-5, W-6
45	Thorpe et al.	.....SOLD OUT.....	
46	Thorpe et al.	.....SOLD OUT.....	
47	Townes	Cataract Surgery: Complications	2 PERIODS W-5, W-6
48	Troutman et al.	Recent Advances in Ophthalmology	8 PERIODS M-5, M-6, T-5, T-6 W-5, W-6, Th-5, Th-6
49	Troutman	Enucleation Surgery	2 PERIODS T-4, T-5
50	Wheeler & Knapp	Concomitant Strabismus	6 PERIODS M-4, M-5, T-4, T-5 W-4, W-5
51	Home Study		10 PERIODS M-4, M-5, M-6, T-4, T-5 T-6, W-4, W-5, W-6, Th-4

SCHEDULE OF INDIVIDUAL COURSES — OPHTHALMOLOGY — Monday

Key M-4 — 2:00 p.m. to 3:00 p.m.

Course No.	SPEAKER	SUBJECT
101	Aldrich	Emotional Problems in the Ophthalmologist's Patients
102	Alfano	Angiography
104	Alvaro	Uveitis: Etiology and Treatment
108	Bannon	Aniseikonia: Its Role in Refractive Problems
111	Berens	Ophthalmic Surgery: New Procedures
112	Bettman	Radioactive Isotopes
116	Bonner	Vascular Retinopathy
123	Chamberlain	Vertical Motor Anomalies
126	Cholst	Central Fields
127	Cohoe	Special Reading Instructions for the Partially Seeing
135	Cutler	Cataract: Methods of Extraction
138	Davis	Sutures in Cataract Surgery
156	Gifford	Local Anesthesia
168	Hogan	Lesions of the Choroid
224	Payne	Extraction of Complicated Cataract
251	Tassman	Retinopathy in Diabetes

Key M-5 — 3:15 p.m. to 4:15 p.m.

Course No.	SPEAKER	SUBJECT
103	Allen, H.	Aseptic Technique
107	Baird	Lesions of the Orbit
130	Cordes	Eye Changes in Diabetes
131	Coston	Inflammatory and Degenerative Disease of the Retina
133	Cunningham	Types of Head Pain
137	Davidson	Surgical Instruments: Preparation and Care
141	Diskan	Visual Screening in Schools
154	Gemeroy	External Diseases
178	Katz	Ophthalmic Anatomy
197	Lloyd	Fundus Lesions of the Senile Eye
208	McDonald	Penetrating Wounds of the Eye
217	Myers	Vertical Phorias and Tropias

Key M-6 — 4:30 p.m. to 5:30 p.m.

Course No.	SPEAKER	SUBJECT
105	Alvis	Glaucoma Surgery
106	Amenabar	..... CANCELLED .....
109	Benedict	Atrophic Changes of the Iris
117	Brown, A.	Fever Therapy vs. Antibiotics and Corticosteroids
118	Calhoun	Epithelization of the Anterior Chamber
119	Carroll	Optic Nerve Lesions
125	Chandler	Cataract Surgery: Complications
136	Daily	Biomicroscopy of Vitreous and Fundus Oculi
139	Day	Medical Exophthalmos
140	DeVoe	Corneal Dystrophies
143	Dunlap	Divergence Anomalies
147	Ferrer	Contact Lenses
152	Gaines	Ophthalmologic Examination from Neuro-ophthalmologic Viewpoint
161	Hanno	Internal Medicine: Ophthalmic Problems
163	Harrington	Dynamics of Phacoerysis
170	Jacobson	Electroretinography
182	Kimura	Chronic Lesions of Anterior Segment
199	Long	Retinoblastoma and the Pseudoretinoblastomas
202	MacLean	Surgical Management of Cataracts
225	Perera	Retinal Detachment
229	Post	Refinements of Refraction
237	Rychener	The Lacrimal Apparatus
246	Solanes	Uveomeningitis Syndromes

SCHEDULE OF INDIVIDUAL COURSES — OPHTHALMOLOGY — Tuesday

Key T-4 — 2:00 p.m. to 3:00 p.m.

Course No.	SPEAKER	SUBJECT
104	Alvaro	Uveitis: Etiology and Treatment
113	Bettman	Value of Goniotomy
121	Cassady	Toxoplasmic Retinochoroiditis
128	Cooper	Principles of Muscle Surgery
129	Cordes	Surgery of Congenital Cataracts
135	Cutler	Cataract: Methods of Extraction
142	Dixon	Indirect Ophthalmoscopy
149	Fralick	Surgical Anatomy in Operations for Glaucoma
150	Fread	Ideal Refraction Equipment
153	Gartner	Fundus Diseases
158	Gump	Recurrent Iridocyclitis
179	Kennedy	Practical Perimetry
188	Leinfelder	Perimetry & Use of Tangent Screen
224	Payne	Extraction of Complicated Cataract
226	Pino & Edwards	Problems in Bifocal Lenses
258	Whalman	Practical Points in Eye Surgery
260	Wood	Central Retinal Lesions

Key T-5 — 3:15 p.m. to 4:15 p.m.

Course No.	SPEAKER	SUBJECT
107	Baird	Lesions of the Orbit
124	Chamlin	Perimetry
145	Falls	Practical Application of Heredity
151	Fry	Lesions at Posterior Pole of Eye
155	Gibson	Retinopathy
157	Gipner	Recent Advances in Ophthalmology
160	Haik	Intracapsular Cataract Extraction
165	Hedges	Neuralgias of the Head
172	Jardon	Fitting Ocular Prostheses
175	Jones, L.	The Lacrimal Drainage System
193	Levy	Motion Picture Photography
207	Maumenee	Surgical Indications for Corneal Procedures
236	Ruedemann	Body Changes Due to Error in Vertical Muscles
255	Veirs	External Dacryocystorhinostomy

Key T-6 — 4:30 p.m. to 5:30 p.m.

Course No.	SPEAKER	SUBJECT
106	Amenabar	..... CANCELLED .....
110	Berens	Cyclodiathermy, Cycloelectrolysis, Iridencleisis & Cyclodialysis
118	Calhoun	Epithelization of the Anterior Chamber
136	Daily	Biomicroscopy of Vitreous and Fundus Oculi
143	Dunlap	Divergence Anomalies
148	Fink	Binocular Problems in Routine Refraction
167	Hill	Cataract Surgery
171	Jampolsky	Ocular Divergence
173	Jobe	Practical Optics
176	Joy	Cerebral Angiography
180	Kestenbaum	Reading Aids for Low Vision
181	Keyes	Retinal Vascular Disease
184	Kornzweig	Practical Embryology
187	Leahey	Corneal Transplantation
194	Lewis	External Diseases
222	Osher	Diagnostic Approach to Squint Surgery
225	Perera	Retinal Detachment
237	Rychener	The Lacrimal Apparatus
239	Scheie	Surgery for Congenital Glaucoma
250	Swan	Value of Drugs in Glaucoma
254	Veasey	Refraction Difficulties
256	Weisser	Chronic Uveitis

SCHEDULE OF INDIVIDUAL COURSES — OPHTHALMOLOGY — Wednesday

Key W-4 — 2:00 p.m. to 3:00 p.m.

Course No.	SPEAKER	SUBJECT
120	Cassady	Dacryocystitis and Lacrimal Drainage
134	Cusick	Ptosis
144	Egan	Cross Cylinder: Application and Theory
159	Haas	Congenital Glaucoma
162	Harley	Lesions of 3rd, 4th and 6th Cranial Nerves
166	Henderson	Chiasmal Area Lesions
186	Kronfeld	Choice of Surgical Procedure in Glaucoma
188	Leinfelder	Perimetry & Use of Tangent Screen
192	Lepard	Eye Diseases Common to Children
195	Linksz & Tait	Telescopic & Magnifying Lenses
203	Macnie	Head Trauma with Ocular Symptoms
204	Mangold	Proper Fitting of Glasses
215	Mullen	Ophthalmic Emergencies
227	Pino & Edwards	Correction of Aphakia
234	Roberts	Early Diagnosis of Glaucoma
238	Scarney	Slit Lamp Biomicroscopy
242	Simpson	Convergence Insufficiency and Divergence Excess
249	Stauffer	Allergic Conditions of the Eye
252	Theodore	Ocular Therapeutics
257	Wendland	Chiasmal Lesions
260	Wood	Central Retinal Lesions

Key W-5 — 3:15 p.m. to 4:15 p.m.

Course No.	SPEAKER	SUBJECT
146	Falls	Ocular Geriatrics
157	Gipner	Recent Advances in Ophthalmology
174	Johnson, C.	Ptosis
183	Klien	Clinical Pathology of the Retina
185	Kronenberg	Practical Ocular Therapeutics
189	Lemoine	Vitreous Opacities
191	Leopold	Advances in Ophthalmic Therapy
198	Lloyd	Diseases of the Cornea
200	Lubkin	Psychosomatic Aspects of Ophthalmology
201	Luce	Wound Healing
205	Mann, M.	Hypertensive Vascular Changes in the Fundus
209	McGraw	Contact Lenses
212	Meyer	Surgical Treatment of Glaucoma
214	Morrison	Office Management of Glaucoma
221	Olson	Iritis, Iridocyclitis & Keratitis
247	Spaeth	Plastic Surgery: Practical Aspects
255	Veirs	External Dacryocystorhinostomy

Key W-6 — 4:30 p.m. to 5:30 p.m.

Course No.	SPEAKER	SUBJECT
114	Block	Office Practice of Ophthalmology
122	Castroviejo	Corneal Surgery: Results
140	DeVoe	Corneal Dystrophies
148	Fink	Binocular Problems in Routine Refraction
169	Iliff	Ptosis
180	Kestenbaum	Reading Aids for Low Vision
190	Lennon	Therapy of Acute Inflammatory Glaucoma
194	Lewis	External Diseases
210	McGuire	Cataract: Management of Patient
213	Miller	Corneal Diseases
216	Murrah	Aids for Subnormal Vision
219	Ogle	Stereopsis: Present Concept
223	Paulson	Lighting for Comfortable and Accurate Seeing
228	Posner	Glaucomatocyclitic Crises
230	Prewitt	External Eye Diseases Associated with Allergy
231	Quereau	Physiology of Ocular Movements
232	Randolph	Advanced Glaucoma
233	Rizzuti	Tumors of the Lids and Ocular Adnexa
235	Rudolph & Schlaegel	Chemotherapy
239	Scheie	Surgery for Congenital Glaucoma
241	Shipman	Scleral Resection
244	Smith, B.	Orbital Fractures
259	Wise	Retinal Vascular Disease

SCHEDULE OF INDIVIDUAL COURSES — OPHTHALMOLOGY — Thursday

Key Th-4 — 2:00 p.m. to 3:00 p.m.

Course No.	SPEAKER	SUBJECT
115	Bonaccolto	Enucleation Techniques
120	Cassady	Dacryocystitis and Lacrimal Drainage
132	Cowen	Office Technique for Simplified Gonioscopy
134	Cusick	Ptosis
142	Dixon	Indirect Ophthalmoscopy
159	Haas	Congenital Glaucoma
162	Harley	Lesions of 3rd, 4th & 6th Cranial Nerves
164	Havener	Ocular Melanoma
166	Henderson	Chiasmal Area Lesions
177	Kasper	Dacryocystorhinostomy
185	Kronenberg	Practical Ocular Therapeutics
192	Lepard	Eye Diseases Common to Children
195	Linksz & Tait	Telescopic & Magnifying Lenses
196	Linn	Choice of Glaucoma Operation
203	Macnie	Head Trauma with Ocular Symptoms
211	McGuire	Surgery of Vertical Muscles
215	Mullen	Ophthalmic Emergencies
218	Newell	Refinements in Ophthalmic Surgery
220	Ogle	Binocular Oculomotor Coordination
221	Olson	Iritis, Iridocyclitis & Keratitis
238	Scarney	Slit Lamp Biomicroscopy
240	Schwartz	Eye Changes Associated with Skeletal Disease
243	Simpson	Probing of Nasolacrimal Duct
245	Snydacker	Luxated & Subluxated Lenses
248	Spaeth	Operation for Complicated Ptosis
249	Stauffer	Allergic Conditions of the Eye
252	Theodore	Ocular Therapeutics
253	Vail	Surgery of Senile Cataract

Key Th-5 — 3:15 p.m. to 4:15 p.m.

Course No.	SPEAKER	SUBJECT
183	Klien	Clinical Pathology of the Retina
206	Mann, W.	Functional Visual Impairment
209	McGraw	Contact Lenses
212	Meyer	Surgical Treatment of Glaucoma
214	Morrison	Office Management of Glaucoma

CONTINUOUS COURSES AND PANEL DISCUSSIONS
OTOLARYNGOLOGY

COURSE	SPEAKERS	SUBJECT	PERIODS USED
301	Brewer & Briess	Voice Therapy	2 PERIODS T-1, T-2
302 or 303	Cohen	Nasal Cartilages	2 PERIODS T-2, T-3 or Th-2, Th-3
304 or 305	Conley, Daly & Lenz	Carcinoma of Head & Neck	2 PERIODS T-1, T-2 or W-2, W-3
306	Converse	Nasal Plastic Surgery—Basic	2 PERIODS T-2, T-3
307	Converse	Nasal Plastic Surgery—Advanced	2 PERIODS W-2, W-3
308 or 309	Craft	Nasal Allergy	2 PERIODS T-1, T-2 or W-1, W-2
310 or 311	Fox	Noise in Industry	2 PERIODS W-2, W-3 or Th-2, Th-3
312 or 313	Hansel	Allergy & Medical Otolaryngology	2 PERIODS T-1, T-2 or Th-1, Th-2
314	Harbert	Clinical Audiology	2 PERIODS W-1, W-2
315 or 316	Hardy & Pauls	Clinical Audiology for Young Children	2 PERIODS T-2, T-3 or Th-2, Th-3
317	Hilding	Physiology of Hearing: Relation to Hearing Loss	2 PERIODS T-1, T-2
318	Hinderer & Philpott	External Pyramid Reconstruction	2 PERIODS T-1, T-2
319	House	.....SOLD OUT.....	
320	House	Surgery for Ear Disease: Tympanoplasty	2 PERIODS Th-2, Th-3
321	Kazanjian et al.	Traumatic Injuries of Face	2 PERIODS Th-1, Th-2
322 or 323	Lathrop et al.	Otological Office Problems	2 PERIODS T-1, T-2 or W-1, W-2
324	Lawrence	Sound Conduction in Middle Ear	2 PERIODS T-1, T-2
325	Lindsay	Deafness & Dizziness	2 PERIODS Th-1, Th-2
326 or 327	Mueller et al.	What the Otologist Should Know About Hearing Aids	2 PERIODS W-2, W-3 or Th-2, Th-3
328	Petrillo & Chessen	External Pyramid Reconstruction	2 PERIODS T-2, T-3
329	Reed et al.	Voice Therapy	2 PERIODS W-2, W-3
330	Riggs & Sputh	External Pyramid Reconstruction	2 PERIODS W-1, W-2
331	Saunders	Oropharyngeal Lesions	2 PERIODS T-1, T-2
332 or 333	Seltzer	A Typical Rhinoplasty	2 PERIODS W-1, W-2 or Th-1, Th-2
334	Semenov	Ear, Nose & Throat Therapeutics	2 PERIODS Th-1, Th-2
335	von Leden & Moore	Organic Voice Problems	2 PERIODS W-2, W-3
336 or 337	Walsh	What Can Be Done for Deafness	2 PERIODS T-1, T-2 or Th-1, Th-2
338 or 339	Work	Techniques in Wide Field Laryngectomy	2 PERIODS T-2, T-3 or W-2, W-3

SCHEDULE OF INDIVIDUAL COURSES — OTOLARYNGOLOGY — Tuesday

Key T-1 — 9:00 a.m. to 10:00 a.m.

Course No.	SPEAKER	SUBJECT
407	Boies	Neurological Disorders
409	Bradley	Sudden Deafness
421	Dolowitz	Adrenal Steroids as Anti-inflammatory Agents
427	Ferguson	Pediatric Bronchography
431	Gardner	Practical Voice Therapy
435	Goodhill	Personal Techniques in Stapes Mobilization
444	Harris	Nasal Polypi
448	Hilsinger	Vascular Headaches
449	Holinger & Johnston	Bronchoscopic Techniques
458	Kos	Stapedial Mobilization
459	Kraus	Adventures in Space: Otolaryngic Aspects
474	Morrison	Children's Injuries
484	Rabbett & Bellucci	Submucous Resection of the Nasal Septum
487	Ronis	Sinus Surgery
501	Suehs	Secretory Otitis Media
507	Van Alyea	Management of Sinusitis

Key T-2 — 10:15 a.m. to 11:15 a.m.

Course No.	SPEAKER	SUBJECT
419	Dickinson	Bone Grafts
428	Fowler	Facial Paralysis and Tics
443	Harkins	Office Management of Allergic Patients
453	Jordan	Nasal Fractures
471	McMahon	Treatment of Sinusitis
475	Myers	Surgery of Chronic Otitis Media
479	Ogura & Birenboim	Roentgenography of the Head and Neck
485	Reger	Practical Office Audiometry
488	Ryan	Headache
502	Tabb	Maxillectomy: Surgical Technique

Key T-3 — 11:30 a.m. to 12:30 p.m.

Course No.	SPEAKER	SUBJECT
401	Alexander	The Adenoid Problem
402	Altmann	Tympanoplasty
403	Anderson	Rhinoplasty: Practical Considerations
405	Becker	Plastic Surgery for Protruding Ears
414	Cody	Eustachian Tube
418	DeWeese	Problem of the Dizzy Patient
423	Erich	Fractures of Facial Bones
426	Feldman	Office Hearing Testing of Young Children
430	Furstenberg	Management of Nasal Obstruction
432	Glorig	The Otologist and the Noise Problem
438	Grandon	Pulsion Diverticulum of the Hypopharynx
445	Harvey	Roentgenograms of Sinuses, Mastoids, & Chest
454	Juers	Preservation of Hearing in Surgery
457	Kobrak	Treatment of Middle Ear Deafness
461	Lempert	Temporal Bone Surgery
464	Limarzi	Blood Disturbances
473	Missal	Skin Testing
476	Neivert	Surgery of Nasal Vault
489	Samter	Steroids in Otolaryngology
503	Tato	Tympanoplasty: Functional Examination

SCHEDULE OF INDIVIDUAL COURSES — OTOLARYNGOLOGY — Wednesday

Key W-1 — 9:00 a.m. to 10:00 a.m.

Course No.	SPEAKER	SUBJECT
404	Baker	Chronic Cough in Children
406	Bellucci	Surgery of Stapes & Oval Window
416	Dean	Practical Neuro-otolaryngology
420	Dixon	Lesions of the Oral Cavity
422	Dougherty	Adrenal Cortical Steroid Hormones
434	Goldman	Vasomotor Rhinitis
435	Goodhill	Personal Techniques in Stapes Mobilization
437	Graham & Dill	Advanced Audiologic Techniques
439	Guilford & Wright	Permeatal Otologic Surgery
446	Hilger	The Injured Malar Bone
448	Hilsinger	Vascular Headaches
451	House	Stapes Mobilization Procedure
458	Kos	Stapedial Mobilization
460	Lederer	Otolaryngologic Misadventures
471	McMahon	Treatment of Sinusitis
472	McNally	Labyrinthine Tests
474	Morrison	Children's Injuries
491	Sellers	Frontal Sinusitis: Acute & Chronic Infections
493	Shambaugh	Otosclerosis: Selection of Therapy
509	Williams	Surgical Exposure of Base of Nose, Maxillary Spine & Pyriform Aperture
510	Wynn	External Nasal Growths

Key W-2 — 10:15 a.m. to 11:15 a.m.

Course No.	SPEAKER	SUBJECT
415	Crispell	Allergy in Children
424	Farrior	Fenestration Operation
428	Fowler	Facial Paralysis and Tics
440	Hale	Voice Therapy
452	Jones	Allergic Rhinitis
456	Kemler	Bilateral Thyrotomy for Carcinoma of Larynx
462	Lepper	Antibiotics in Otolaryngology
463	Lewy	Direct Laryngoscopy
467	Lynch	Suspension Laryngoscopy
477	Norris	Partial Laryngectomy
482	Perlman	Fluid in the Middle Ear
486	Rinkel	Food Allergy
495	Simonton	Nasal Polyps
506	Tremble	Practical Therapeutics in Office Practice

Key W-3 — 11:30 a.m. to 12:30 p.m.

Course No.	SPEAKER	SUBJECT
410	Brodnitz	The Actor & Singer in ENT Practice
412	Canfield	Speech Audiometry
413	Clerf	Causes of Hoarseness
414	Cody	Eustachian Tube
418	DeWeese	Problem of the Dizzy Patient
423	Erich	Fractures of Facial Bones
431	Gardner	Practical Voice Therapy
438	Grandon	Pulsion Diverticulum of the Hypopharynx
441	Hallberg	Severe Nosebleed
442	Hampsey	Sinusitis in Children
455	Kastein	Disorders of Communication in Children
461	Lempert	Temporal Bone Surgery
465	Loch	Septum Deviations
466	Lubart	Complications in Rhinoplasty
469	McGovern	Facial Nerve Diseases
480	Pastore	Lump in the Throat
496	Skolnik	Electrodiagnosis of Diseases of Facial Nerve
497	Slaughter	Unilateral Tonsillectomy
504	Tato	Tympanoplasty

SCHEDULE OF INDIVIDUAL COURSES — OTOLARYNGOLOGY — Thursday

Key Th-1 — 9:00 a.m. to 10:00 a.m.

Course No.	SPEAKER	SUBJECT
405	Becker	Plastic Surgery for Protruding Ears
406	Bellucci	Surgery of Stapes & Oval Window
407	Boies	Neurological Disorders
420	Dixon	Lesions of the Oral Cavity
434	Goldman	Vasomotor Rhinitis
437	Graham & Dill	Advanced Audiologic Techniques
441	Hallberg	Severe Nosebleed
447	Hilger	Acute Nasal Injuries
454	Juers	Preservation of Hearing in Surgery
460	Lederer	Otolaryngologic Misadventures
468	Maxwell	Tumors of the Parotid Glands
470	McLaurin	Treatment of External Otitis
472	McNally	Labyrinthine Tests
490	Sellers	Office Practice of Otolaryngology
505	Tato	External Frontal Sinus Surgery
508	Weaver	Tumors of the Face
510	Wynn	External Nasal Growths
511	Levin	Management of Recovery Room

Key Th-2 — 10:15 a.m. to 11:15 a.m.

Course No.	SPEAKER	SUBJECT
411	Brodnitz	Vocal Rehabilitation
415	Crispell	Allergy in Children
433	Glorig	Hearing Aid Selection
450	Holinger & Johnston	Pediatric Laryngology
477	Norris	Partial Laryngectomy
478	Ogura	Laryngectomy and Neck Dissection
481	Pearlman	ENT Complaints in Old Age
492	Senturia	Diseases of External Ear
495	Simonton	Nasal Polyps
499	Snitman & Loewy	Surgery of the Neck
500	Som	Hemilaryngectomy
506	Tremble	Practical Therapeutics in Office Practice
507	Van Alyea	Management of Sinusitis

Key Th-3 — 11:30 a.m. to 12:30 p.m.

Course No.	SPEAKER	SUBJECT
402	Altmann	Tympanoplasty
408	Bolotow	Recent Advances in Rhinoplasty
412	Canfield	Speech Audiometry
413	Clerf	Causes of Hoarseness
417	Derlacki	Conductive Deafness
425	Farrior	Practicing Practical Otology
430	Furstenberg	Management of Nasal Obstruction
436	Goodhill	Endotympanic Surgery
467	Lynch	Suspension Laryngoscopy
483	Proetz	Nasal Health & Air Conditioning
493	Shambaugh	Otosclerosis: Selection of Therapy
494	Simmons	Problem of the Bleeding Patient
498	Slaughter	Facial Fractures

DIRECTORY OF OPHTHALMOLOGIC AND OTOLARYNGOLOGIC SOCIETIES

Secretaries of Societies are requested to furnish the information necessary to make this list complete and keep it up to date. Send to TRANSACTIONS, *American Academy of Ophthalmology and Otolaryngology, 15 Second St. S.W., Rochester, Minn.*

EXAMINING AND CERTIFYING BODIES

American Board of Ophthalmology

Chairman: Dr. Brittain F. Payne
Secretary: Dr. Merrill J. King, Box 236, Cape Cottage Branch, Portland 9, Maine
Practical Examination: October 7-11, 1957; Chicago
Written Examination: January 1958. Applications to be filed by July 1, 1957.

American Board of Otolaryngology

President: Dr. Gordon D. Hoople
Secretary-Treasurer: Dr. Dean M. Lierle, University Hospitals, Iowa City, Iowa
Oral Examination: October 7-11, 1957; Palmer House, Chicago

American Board of Plastic Surgery

Chairman: Dr. James T. Mills
Secretary-Treasurer: Dr. Bradford Cannon, 330 Dartmouth St., Boston 16
Corresponding Secretary: Estelle E. Hillerich, 4647 Pershing Ave., St. Louis 8

Brazilian Board of Ophthalmology

Chairmen: Prof. Moacyr E. Alvaro
Prof. Cyro de Rezende
General Secretaries: Dr. Rubens Belfort Mattos, Caixa Postal 4086, Sao Paulo, Brazil
Dr. Sylvio de Almeida Toledo, Braulio Gomes 25, Sao Paulo, Brazil

The Royal College of Physicians and Surgeons of Canada

President: Dr. Robert M. Janes
Honorary Secretary: Dr. James H. Graham, 150 Metcalfe St., Ottawa 4, Ont., Canada

INTERNATIONAL

Concilium Ophthalmologicum Universale (International Council of Ophthalmology)

President: Sir Stewart Duke-Elder
Secretary: Prof. Dr. Edward Hartmann, 2 Ave. Ingres, Paris (16e), France
Time and Place: The Council meets at the time and place of each International Congress (usually every 4 years) and other years alternately in France and Great Britain

Eighteenth International Congress of Ophthalmology

President: Dr. Leon Coppez
General Secretary: Prof. Jules Francois, 15, place de Smet de Naeyer, Gand, Belgium
Time and Place: September 8-12, 1958; Brussels, Belgium

International Association of Secretaries of Ophthalmological and Otolaryngological Societies

President: Dr. A. E. Cruthirds
Secretary-Treasurer: Dr. Edley H. Jones, 1301 Washington St., Vicksburg, Miss.
Time and Place: October 13-16, 1957; Palmer House, Chicago

International Association for the Prevention of Blindness

President: Prof. A. Franceschetti
Secretary: Dr. J. P. Baillart, 47 rue de Bellechasse, Paris VII, France
Time and Place: 1960; Caracas, Venezuela (Jointly with Pan-American Association of Ophthalmology)

International Congress of Bronchoesophagology

President: Dr. Theodor Hünermann
Secretary: Dr. Chevalier L. Jackson, 3401 N. Broad St., Philadelphia 40

International College of Surgeons, Section of Ophthalmology and Otolaryngology

President: Dr. Henry M. Scheer
Secretary: Dr. Louis Savitt, 3403 Lawrence Ave., Chicago 25
Time and Place: September 9-12; Palmer House, Chicago

International Federation of Ophthalmological Societies

President: Sir Stewart Duke-Elder
Secretary: Prof. Dr. Edward Hartmann, 2 Ave. Ingres, Paris (16e), France
Time and Place: September 1958; Brussels, Belgium

International Organization Against Trachoma

President: Prof. G. B. Bietti
Secretary-General: Jean Sedan, 94 rue Sylvabelle, Marseilles, France
Time and Place: September 8-12, 1958; Brussels, Belgium

Pan-American Association of Ophthalmology

President: Dr. Brittain F. Payne
Secretaries: For North of Panama: Dr. J. Wesley McKinney, Exchange Bldg., Memphis, Tenn.
For South of Panama: Dr. Jorge Balza, Azcuenaga 1059, Buenos Aires, Argentina
Time and Place: *Sixth Pan-American Congress of Ophthalmology;* 1960, Caracas, Venezuela

PAN-AMERICAN ASSOCIATION OF OTO-RHINO-LARYNGOLOGY AND BRONCHO-ESOPHAGOLOGY

President: Dr. José Gros
Secretary: Dr. Chevalier L. Jackson, 3401 N. Broad St., Philadelphia 40, Pa.
Time and Place: *Sixth Pan-American Congress of Oto-Rhino-Laryngology and Broncho-Esophagology;* Brazil, 1958

SEVENTH INTERNATIONAL CONGRESS OF OTOLARYNGOLOGY

President: Dr. Arthur W. Proetz
Secretary: Dr. Paul H. Holinger, 700 North Michigan Ave., Chicago
Time and Place: 1961; Paris, France

FOREIGN

Argentina

SOCIEDAD ARGENTINA DE OFTALMOLOGIA

President: Dr. Hector R. Picoli
Secretary: Dr. Alberto F. Arata, Santa Fé, 1171, Buenos Aires
Time and Place: Third Wednesday of every month; Buenos Aires

Australia

OPHTHALMOLOGICAL SOCIETY OF AUSTRALIA

President: Dr. Kevin T. O'Day
Secretary: Dr. Peter A. Rogers, 27 Commonwealth St., Sydney
Time and Place: September 30, 1957, Melbourne, Victoria; October 6-12, 1958, Adelaide, So. Australia

Austria

OSTERREICHISCHE OTO-LARYNGOLOGISCHE GESSELLSCHAFT
(AUSTRIAN OTOLARYNGOLOGICAL SOCIETY)

President: Prof. Dr. Emil Schlander
Secretary: Dr. Julius Popper, Schottenring 17, Vienna I.
Time and Place: First Tuesday of the month; Vienna General Hospital, Alserstrasse 4, Vienna IX.

OSTERREICHISCHEN OPHTHALMOLOGISCHEN GESELLSCHAFT
(AUSTRIAN OPHTHALMOLOGICAL SOCIETY)

President: Prof. Dr. Josef Böck
Secretary: Dr. Franz Schwab, 1, Universitäts Augënklinik, Spitalgasse, 2, Vienna 9
Time and Place: January 1958; Innsbruck

OPHTHALMOLOGISCHE GESELLSCHAFT IN WIEN
(VIENNA OPHTHALMOLOGICAL SOCIETY)

President: Prof. Dr. Josef Böck
Secretary: Dr. Hans Rotter, II. Univ. Augenklinik, Alserstrasse 4, Wien 9
Time and Place: October 10, November 11, and December 9, 1957; January 13, March 10, April 14, May 12, and June 9, 1958; Vienna

Belgium

SOCIETE BELGE D'OPHTALMOLOGIE

Secretary: Prof. Dr. M. Appelmans, 179 ave. Reulens, Louvain, Brussels
Time and Place: June 30 and November 24, 1957; Blvd. de Waterloo 54, Brussels

Brazil

SOCIEDADE BRASILEIRA DE OFTALMOLOGIA

President: Dr. Jose Barbosa da Luz
Secretaries: Dr. Paulo Veloso, Dr. A. Procopio Teixeira, Dr. Antonio Giardulli

CENTRO DE ESTUDOS DE OFTALMOLOGIA

President: Dr. Rubens Belfort Mattos
Secretary: Dr. Renato de Toledo, Rua Condessa de Sao Joaquim 288, Sao Paulo, Brazil
Time and Place: Every Tuesday, Rua Condessa Sao Joaquim 288, Sao Paulo

SOCIEDADE DE OFTALMOLOGIA E OTORRINOLARINGOLOGIA
DO RIO GRANDE DO SUL

President: Dr. Paulo Fernando Esteves
Secretary: Dr. Carlos Buede, Av. Salgado F° 233, Porto Alegre, Rio Grande
Time and Place: Third Wednesday of month; Rua Uruguay, 240 — X Floor, Porto Alegre, Rio Grande do Sul

Canada

CANADIAN MEDICAL ASSOCIATION, SECTION ON OPHTHALMOLOGY

Chairman: Dr. Edward F. Foy
Secretary: Dr. Robert W. Robertson, 305 Northgate Bldg., Edmonton, Alta.
Time and Place: June 17-21, 1957; The MacDonald, Edmonton, Alta.

CANADIAN OPHTHALMOLOGICAL SOCIETY

President: Dr. John McLean
Secretary: Dr. R. G. C. Kelly, 90 St. Clair Ave. West, Toronto 7, Ont.

CANADIAN OTOLARYNGOLOGICAL SOCIETY

President: Dr. G. M. T. Hazen
Secretary: Dr. G. Arnold Henry, Suite 328-Medical Arts Bldg., Toronto, Ont.

MONTREAL OPHTHALMOLOGICAL SOCIETY

President: Dr. Roland Viger
Secretary: Dr. G. Cousineau, 300 St. Louis Square, Montreal
Time and Place: October 10, Royal Victoria Hospital; December 12, Notre Dame Hospital; February 13, 1958, Montreal General Hospital; April 10, 1958, Hotel Dieu Hospital

NOVA SCOTIA SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. H. R. McKean
Secretary: Dr. C. F. Keays, 324 Spring Garden Rd., Halifax
Time and Place: November 1957; Lord Nelson Hotel, Halifax

OPHTHALMOLOGICAL AND OTOLARYNGOLOGICAL SOCIETY OF ALBERTA

President: Dr. M. S. Miller
Secretary: Dr. M. R. Marshall, University Hospital, Edmonton, Alta.
Time and Place: April 26-27, 1958; Calgary, Alta.

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA

President: Dr. Robert M. Janes
Honorary Secretary: Dr. James H. Graham, 150 Metcalfe St., Ottawa 4, Ont.

TORONTO ACADEMY OF MEDICINE, SECTION OF OPHTHALMOLOGY

Chairman: Dr. George A. Thompson
Secretary: Dr. J. Lloyd Burns, 1421 Danforth Ave., Toronto, Ont.
Time and Place: Each meeting by separate arrangement

Chile

SOCIEDAD CHILENA DE OFTALMOLOGIA

President: Dr. Abraham S. Schweitzer
Secretary: Dr. Raul E. Valenzuela, Agustinas 715, of. 104, Santiago
Time and Place: IV Jorandes Nacionales de Oftalmologia, November 1958, Santiago

Colombia

SOCIEDAD COLOMBIANA DE OFTALMOLOGIA Y OTORRINOLARINGOLOGIA

President: Dr. Francisco Vernaza
Secretary: Dr. Felix E. Lozano, Aparto Aereo 56-01, Bogota, D.E., Colombia
Time and Place: VIII Convencion Nacional de Oftalmologia y Otorrinolaringologia, June 25-27, 1957; Barranquilla

Cuba

SOCIEDAD CUBANA DE OFTALMOLOGIA

President: Dr. Rafael Labrador Fuiz
Secretary: Dr. Guillermo De La Torre, Calle G. No. 506, Vedado, Havana
Time and Place: First Thursday bi-monthly; Malecon 61, Bajos, Havana

Denmark

OPHTHALMOLOGICAL SOCIETY IN COPENHAGEN, DENMARK

President: Dr. Børge Lawatz
Secretary: Dr. Jens Edmund, University Eye Clinic, Copenhagen

Egypt

OPHTHALMOLOGICAL SOCIETY OF EGYPT

President: Dr. Mohammad Abd El Monim Labib
Secretary: Dr. Sabri Kamel, 44 Al Gumhuriat St., Cairo
Time and Place: March 1958; Memorial Institution of Ophthalmic Research, Giza

France

SOCIETE FRANCAISE D'OPHTALMOLOGIE

President: Prof. Guy Offret
Secretary: Dr. Gabriel Lombard, Hospital Cochin-Pavillon Sicard-27, rue du Fg St. Jacques, Paris

Germany

GERMAN OPHTHALMOLOGICAL SOCIETY
(UNITED CONGRESS)

President: Prof. Dr. Rudolf Thiel
Secretary: Prof. Dr. E. Engelking, Univ.-Augenklinik, Heidelberg
Time and Place: 8:00 p.m., September 2, 1957; Heidelberg

DEUTSCHE OPHTHALMOLOGISCHE GESELLSCHAFT HEIDELBERG

President: Prof. Dr. Rudolf Thiel
Secretary: Prof. Dr. E. Engelking, Kapellenneg 22, Heidelberg
Time and Place: September 8-12, 1957; University Bldg., Heidelberg

Great Britain

BRITISH ASSOCIATION OF OTOLARYNGOLOGISTS

President: Dr. I. Simson Hall, F.R.C.P.E., F.R.C.S.E.
Secretary: Mr. Myles L. Formby, F.R.C.S., 45 Lincoln's Inn Fields, London W.C.2.

FACULTY OF OPHTHALMOLOGISTS

President: Mr. L. H. Savin, M.D., M.S., M.R.C.P., F.R.C.S.
Secretary: Mr. E. F. King, F.R.C.S., D.O.M.S., 45 Lincoln's Inn Fields, London W.C. 2.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM

President: Mr. J. J. Healy, M.B., Ch.B.
Secretaries: Mr. J. R. Hudson, M.B., F.R.C.S.; Mr. K. C. Wybar, M.D., Ch.M., F.R.C.S., D.O.M.S., 45 Lincoln's Inn Fields, London, W.C. 2

ROYAL SOCIETY OF MEDICINE, SECTION OF OPHTHALMOLOGY

President: Mr. J. R. Wheeler, F.R.C.S. Ed.
Honorary Secretary: Mr. D. P. Greaves, F.R.C.S., 56 Wimpole St., London, W. 1
Time and Place: 4:30 p.m., second Thursday of October, November, December, February, March, May, and June; 1 Wimpole St.

MIDLAND OPHTHALMOLOGICAL SOCIETY
President: Mr. R. D. Weeden Butler
Secretaries: Mr. M. J. Roper-Hall and Mr. W. Martin Walker, Birmingham and Midland Eye Hospital, Church St., Birmingham 3
Time and Place: October-June, according to programme director; Birmingham and Midland Eye Hospital, Church St., Birmingham 3

OXFORD OPHTHALMOLOGICAL CONGRESS
President: Sir J. W. Tudor Thomas, F.R.C.S.
Secretary: Ian C. Fraser, F.R.C.S., 21 Dogpole, Shrewsbury, Shropshire
Time and Place: July 7-9, 1957; Lecture Hall, School of Physiology, Oxford

SCOTTISH OPHTHALMOLOGICAL CLUB
President: Dr. John Marshall
Secretary: Dr. John D. Fraser, 31 Kingsborough Gardens, Glasgow

SOUTHERN OPHTHALMOLOGICAL SOCIETY, ENGLAND
President: F. Oliver Walker, M.R.C.S., L.R.C.P., D.P.M., D.O. (Oxon.)
Secretary: Nigel Cridland, D.M., D.O., (Oxon), 25 Craneswater Park, Southsea, Hants.

India

ALL-INDIA OPHTHALMOLOGICAL SOCIETY
President: Dr. D. G. Patwardhan
Secretaries: Dr. Y. K. C. Pandit and Col. B. Basu, Bombay Mutual Bldg., Dadabhoy Naoroji Road, Bombay 1
Time and Place: February 20-22, 1958; Indore

BOMBAY OPHTHALMOLOGISTS' ASSOCIATION
President: Dr. H. D. Patel
Secretaries: Dr. B. B. Valankar, and Dr. V. S. Talwalker, 213 Charni Road, Girgaum, Bombay 4
Time and Place: 7:30 p.m., third Wednesday of each month; at different hospitals

OPHTHALMOLOGICAL SOCIETY OF BENGAL
President: Capt. K. L. Sen
Secretaries: Dr. S. Bagchi and Dr. M. Sengupta, 94 Chittaranjan Ave., Calcutta 12
Time and Place: September 30, 1957; The Eye Infirmary Medical College, Calcutta

Ireland

IRISH OPHTHALMOLOGICAL SOCIETY
President: Dr. A. J. Mooney
Secretary: Dr. L. B. Somerville-Large, 2 Fitzwilliam Place, Dublin

The Netherlands

NEDERLANDSCH OOGHEELKUNDIG GEZELSCHAP
(THE NETHERLANDS OPHTHALMOLOGICAL SOCIETY)
President: Prof. Dr. A. Hagedorn
Secretary: Dr. P. G. Binkhorst, Sweelincklaan 20, Bilthoven
Time: December 13 and 14, 1957.

New Zealand

OPHTHALMOLOGICAL SOCIETY OF NEW ZEALAND
President: Dr. W. Hope Robertson
Secretary: Dr. C. C. Ring, 1A Alfred St., Auckland
Time and Place: October 15-18, 1957; Hamilton

Norway

NORSKE OYELEGERS FORENING
(SOCIETY OF NORWEGIAN OPHTHALMOLOGISTS)
President: Dr. Ludvig Wirsching
Secretary: Dr. med. Hans P. Petersen, Rikshopitalets Øyeavdeling, Oslo
Time: Each Spring and Autumn

Paraguay

SOCIETY OF OPHTHALMOLOGY OF PARAGUAY
President: Dr. Armindo Riquelme
Secretary: Dr. Honorio Campuzano, Coronel Bogado 492, Asuncion, Paraguay
Time and Place: Monthly; Circulo Paraguayo de Medicos

Portugal

SOCIEDAD PORTUGUSEA DE OTORRINOLARINGOLOGIA E DE BRONCO-ESOFAGOLOGIA
President: Dr. Alberto Luis de Mendonca
Secretaries: Dr. Antonio da Costa Quinta and Dr. Albano Coelho, Avenida da Liberdade, 65, Lisbon 1

Union of South Africa

OPHTHALMOLOGICAL SOCIETY OF SOUTH AFRICA
President: Dr. R. L. H. Townsend
Secretary: Dr. J. Guilliaume Louw, 17 Church Square, Cape Town
Time and Place: September 1958; Cape Town

Spain

SOCIEDAD OFTALMOLOGICA HISPANO-AMERICANA
President: Prof. Dr. J. Perez-Llorca
Secretary: Dr. Carlos Costi Garcia de Tunon, Montalban, 7, Madrid
Time and Place: September 1957; Canary Islands

Sweden

SVENSKA OGONLAKAREFORENINGEN, SVENSKA LAKARESALLSKAPETS SEKTION FOR OFTALMOLOGI
President: Prof. G. v. Bahr
Secretary: Dr. K. O. Granstrom, Sodermalmstorg 4, Stockholm So.
Time and Place: 1957; Stockholm

Venezuela

SOCIEDAD VENEZOLANA DE OTORRINOLARINGOLOGIA

President: Dr. Alfredo Celis Perez
Secretary: Dr. Jesus Miralles, Local del Colegio de Medicos del Destrito Federal Avenida **Bellas Artes-Urban, Los Chaguaramos, Caracas**

NATIONAL

AMERICAN ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. Erling W. Hansen
Executive Secretary-Treasurer: Dr. William L. Benedict, 15 Second St. S.W., Rochester, Minn.
Time and Place: October 13-18, 1957; Palmer House, Chicago

AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION

President: Dr. Clarence W. Engler
Secretary: Dr. F. Johnson Putney, 1719 Rittenhouse Sq., Philadelphia 3
Time and Place: Afternoons only, May 21-23, 1958; Mark Hopkins Hotel, San Francisco

AMERICAN LARYNGOLOGICAL ASSOCIATION

President: Dr. Harry P. Schenck
Secretary: Dr. James H. Maxwell, Out-Patient Clinic Bldg., University Hospital, Ann Arbor, Michigan
Time and Place: May 19 and 20, 1958; Fairmont Hotel, San Francisco

AMERICAN LARYNGOLOGICAL, RHINOLOGICAL AND OTOLOGICAL SOCIETY, INC.

President: Dr. Lawrence R. Boies
Secretary: Dr. C. Stewart Nash, 708 Medical Arts Bldg., Rochester 7, N. Y.

Eastern Section

Vice-President: Dr. Chevalier L. Jackson
Secretary: Dr. F. Johnson Putney, 1719 Rittenhouse Sq., Philadelphia 3
Place: Philadelphia

Middle Section

Vice-President: Dr. Francis L. Lederer
Secretary: Dr. Marlow W. Manion, 601 Hume Mansur Bldg., Indianapolis 4, Ind.
Time and Place: January 1958; Chicago

Southern Section

Vice-President: Dr. Sam H. Sanders
Secretary: Dr. James A. Harrill, Wake Forest College, Winston-Salem, N. C.

Western Section

Vice-President: Dr. Ben R. Dysart
Secretary: Dr. Francis Sooy, 490 Post St., San Francisco

AMERICAN MEDICAL ASSOCIATION, SECTION ON OPHTHALMOLOGY

Chairman: Dr. Algernon B. Reese
Secretary: Dr. Harold G. Scheie, 313 South 17th St., Philadelphia 3

AMERICAN MEDICAL ASSOCIATION, SECTION ON OTOLARYNGOLOGY

Chairman: Dr. John R. Lindsay
Secretary: Dr. Hugh A. Kuhn, 112 Rimbach St., Hammond, Ind.

AMERICAN OPHTHALMOLOGICAL SOCIETY

President: Dr. Frederick C. Cordes
Secretary-Treasurer: Dr. Maynard C. Wheeler, 30 W. 59th St., New York 19

AMERICAN OTOLOGICAL SOCIETY, INC.

President: Dr. Dean M. Lierle
Secretary-Treasurer: Dr. Lawrence R. Boies, University Hospital, Minneapolis 14
Time and Place: May 17 and 18, 1958; Fairmont Hotel, San Francisco

AMERICAN OTORHINOLOGIC SOCIETY FOR PLASTIC SURGERY

President: Dr. Armand Caron
Secretary: Dr. Louis Joel Feit, 66 Park Ave., New York 16
Time and Place: April 26, 1958; Waldorf-Astoria Hotel, New York City

AMERICAN SOCIETY OF OPHTHALMOLOGIC AND OTOLARYNGOLOGIC ALLERGY

President: Dr. Sam H. Sanders
Secretary-Treasurer: Dr. Michael H. Barone, 468 Delaware Ave., Buffalo 2
Time and Place: October 17 and 18, 1957; Palmer House, Chicago

ASSOCIATION FOR RESEARCH IN OPHTHALMOLOGY, INC.

Chairman: Dr. William B. Clark
Secretary: Dr. Lorand V. Johnson, 10515 Carnegie Ave., Cleveland 6

NATIONAL SOCIETY FOR THE PREVENTION OF BLINDNESS

President: Mr. Mason H. Bigelow
Executive Director: Dr. Franklin M. Foote, 1790 Broadway, New York 19
Time and Place: March 12-14, 1958; Bellevue-Stratford Hotel, Philadelphia

OTOSCLEROSIS STUDY GROUP

President: Dr. Joseph A. Sullivan
Secretary-Treasurer: Dr. Arthur L. Juers, 611 Brown Bldg., Louisville, Ky.
Time and Place: 6:30 p.m., October 12, 1957; Palmer House, Chicago

PUERTO RICO MEDICAL ASSOCIATION
(SECTION ON OPHTHALMOLOGY AND OTOLARYNGOLOGY)

President: Dr. Antonio Rullan
Secretary for Ophthalmology: Dr. Carlos J. Margarida, Box 9111, Santurce
Secretary for Otolaryngology: Dr. Lorenzo Arsuaga, Box 9111, Santurce
Time and Place: December 1957; Santurce

PUERTO RICO OPHTHALMOLOGICAL ASSOCIATION

President: Dr. Luis J. Fernandez
Secretary-Treasurer: Dr. Guillermo Pico, 654 Ponce de Leon Ave., Santurce
Time and Place: December 1957; Santurce

SOCIETY OF MILITARY OPHTHALMOLOGISTS

President: Capt. Stephen J. Ryan, (MC, USN)
Secretary: Lt. Col. Raymond A. Skeehan, Jr., (USN); Armed Forces Institute of Pathology, NRAMC, Washington 25, D. C.
Time and Place: 7:00 p.m., October 15, 1957; Palmer House, Chicago

REGIONAL

ARK-LA-TEX OTO-OPHTHALMIC SOCIETY

President: Dr. Ray Carter
Secretary: Dr. Paul Swearingen, Garrett Bldg., Shreveport, La.
Time and Place: First Monday of each month; Confederate Memorial Hospital, Shreveport

HAWAII EYE, EAR, NOSE AND THROAT SOCIETY

President: Dr. Robert H. Lee
Secretary: Dr. Howard H. Honda, 1481 S. King St., Honolulu
Time and Place: 6:30 p.m., third Thursday of each month except July, August, and September; Honolulu

INTER-MOUNTAIN OTO-OPHTHALMOLOGICAL SOCIETY

President: Dr. Alan Crandall
Secretary: Dr. Whitney J. Haight, 909 Boston Bldg., 9 Exchange Pl., Salt Lake City 1, Utah
Time and Place: Third Monday of each month; University Club, Salt Lake City

LOUISIANA-MISSISSIPPI OPHTHALMOLOGICAL AND OTOLARYNGOLOGICAL SOCIETY

President: Dr. A. J. McComiskey
Secretary-Treasurer: Dr. Edley H. Jones, 1301 Washington St., Vicksburg, Miss.
Time and Place: April 11 and 12, 1958; Edgewater Gulf Hotel, Edgewater Park, Miss.

NEW ENGLAND OPHTHALMOLOGICAL SOCIETY

President: Dr. Virgil G. Casten
Secretary: Dr. Edwin B. Goodall, 328 Washington St., Wellesley Hills 82, Mass.
Time and Place: Third Wednesday of each month, November-April; Massachusetts Eye and Ear Infirmary, 243 Charles St., Boston

NEW ENGLAND OTO-LARYNGOLOGICAL SOCIETY

President: Dr. Burton E. Lovesey
Secretary: Dr. Burton E. Lovesey, 15 West Central St., Natick, Mass.
Time and Place: Three times a year, Massachusetts Eye and Ear Infirmary, 243 Charles St., Boston

PACIFIC COAST OTO-OPHTHALMOLOGICAL SOCIETY

President: Dr. Howard P. House
Secretary: Dr. Homer E. Smith, 686 Twelfth Ave., Salt Lake City 3, Utah
Time and Place: May 11-16, 1958; Vancouver, B. C.

SIOUX VALLEY ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. Martin Ryan
Secretary: Dr. Sidney F. Becker, B-1600 S. Western Ave., Sioux Falls, S. D.
Time and Place: February 1958; Sioux Falls

SOUTHERN MEDICAL ASSOCIATION, SECTION ON OPHTHALMOLOGY AND OTOLARYNGOLOGY

Chairman: Dr. Sherman B. Forbes
Secretary: Dr. G. S. Fitz-Hugh, 104 E. Market St., Charlottesville, Va.
Time and Place: November 11-13, 1957; Miami, Fla.

WISCONSIN-UPPER MICHIGAN SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. Donald H. Boyce
Secretary: Dr. G. L. McCormick, 650 S. Central Ave., Marshfield, Wis.

STATE AND LOCAL

Alabama

ALABAMA ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. Thomas O. Paul
Secretary: Dr. Eugene Callaway, Jr., 228 Selma Ave., Selma
Place: Point Clear

Arkansas

ARKANSAS MEDICAL SOCIETY, EYE, EAR, NOSE AND THROAT SECTION

President: Dr. Max Baldridge
Secretary: Dr. James L. Smith, 623 Woodlane, Little Rock
Time and Place: April; Little Rock

California

CALIFORNIA MEDICAL ASSOCIATION, EYE SECTION

President: Dr. Harold B. Alexander
Secretary: Dr. O. Ralph Tanner, 300 Homer Ave., Palo Alto
Time and Place: April 27, 1958; Los Angeles

ALTA CALIFORNIA OPHTHALMOLOGICAL SOCIETY

President: Dr. Rulon S. Tillotson
Secretary: Dr. Robert L. Alexander, 1127 Eleventh St., Sacramento
Time and Place: Third Thursday of every month except June, July, and August; Sutter Club, Sacramento

EAST BAY OPHTHALMOLOGICAL SOCIETY

President: Dr. Homer Howells
Secretary: Dr. Owen C. Dickson, 2320 Channing Way, Berkeley
Time and Place: Quarterly; various places

LOS ANGELES OPHTHALMOLOGICAL JOURNAL CLUB

President: Dr. Sol Ludmerer
Secretary: Dr. Sol Ludmerer, 3736 Atlantic Ave., Long Beach 7
Time and Place: Third Monday of each month, September-June; Los Angeles Medical Association

LOS ANGELES SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. Sol Rome
Secretary: Dr. Max Pohlman, 2200 W. Third St., Los Angeles 57
Time and Place: 6:00 p.m., fourth Monday, September-June, Otolaryngology; 6:00 p.m., first Thursday, September-June, Ophthalmology; Los Angeles County Medical Assn. Bldg., 1925 Wilshire Blvd.

PENINSULA EYE SOCIETY

President: Dr. Howard Trolan
Secretary: Dr. William J. Hornyak, 1303 San Carlos Ave., San Carlos
Time: Third Thursday of every month, except July, August, and December

SAN DIEGO OPHTHALMOLOGICAL SOCIETY

President: Dr. George E. Zukovich
Secretary: Dr. A. B. Root, 3315 Fourth Ave., San Diego 3
Time and Place: 6:30 p.m., second Monday of each month; University Club

SAN FRANCISCO MEDICAL SOCIETY, EYE SECTION

Chairman: Dr. Margaret Henry, 384 Post St., San Francisco 8
Time and Place: First Tuesday in April, second Tuesday in September, first Tuesday in December; Medical Society Bldg., 250 Masonic Ave.

SAN FRANCISCO OPHTHALMOLOGICAL ROUND TABLE

President: Dr. George S. Campion
Secretary-Treasurer: Dr. Albert J. Brinckerhoff, 490 Post St., San Francisco
Time: Three times a year; San Francisco

SANTA BARBARA OPHTHALMOLOGICAL SOCIETY

President: Dr. Michel Loutfallah
Secretary: Dr. Paul M. Brickley, 317 W. Pueblo St., Santa Barbara
Time and Place: Third Thursday evening of every month; different locations

Colorado

COLORADO OPHTHALMOLOGICAL SOCIETY

President: Dr. James P. Rigg
Secretary: Dr. Max Kaplan, Republic Bldg., Denver
Time and Place: Third Saturday of each month, September-May; University of Colorado Medical Center

COLORADO OTOLARYNGOLOGICAL SOCIETY

President: Dr. Daniel Franklin
Secretary: Dr. Carl W. Whistler, 701 Birch, Denver 20
Time and Place: 6:00 p.m., first Saturday of each month; Colorado General Hospital

Connecticut

CONNECTICUT STATE MEDICAL SOCIETY, EYE, EAR, NOSE AND THROAT SECTION

Chairman: Dr. Max Alpert
Secretary-Treasurer: Dr. Frederick Wies, 255 Bradley St., New Haven

Florida

FLORIDA SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. Carl S. McLemore
Secretary: Dr. Joseph Taylor, Jr., Citizens Bldg., Tampa

GREATER MIAMI EYE, EAR, NOSE AND THROAT SOCIETY

President: Dr. M. A. Schofman
Secretary-Treasurer: Dr. James H. Mendel, Jr., 7241 Red Road, Miami
Time and Place: 6:30 p.m., second Thursday of March, May, October, and December; Seven Seas Restaurant

Georgia

GEORGIA SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. F. Phinizy Calhoun, Jr.
Secretary: Dr. Walter P. Rhyne, Box 206, Albany
Time and Place: March 7 and 8, 1958; Savannah

ATLANTA EYE, EAR, NOSE AND THROAT SOCIETY

President: Dr. Nathan Gershon
Secretary-Treasurer: Dr. Jack Stokes, 512 Medical Arts Bldg., 384 Peachtree St., N.E., Atlanta
Time and Place: Fourth Monday of each month, Fulton County Academy of Medicine, Atlanta

Illinois

CENTRAL ILLINOIS SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. Edward C. Albers
Secretary: Dr. Clarence A. Fleischli, 520 E. Allen St., Springfield
Time and Place: September 27-29, 1957; Springfield

CHICAGO LARYNGOLOGICAL AND OTOLOGICAL SOCIETY

President: Dr. Stanton A. Friedberg
Secretary: Dr. Fletcher Austin, 700 N. Michigan, Chicago
Time and Place: First Monday of each month; Furniture Club of America, 666 Lake Shore Drive, Chicago

CHICAGO OPHTHALMOLOGICAL SOCIETY

President: Dr. Frank W. Newell
Secretary-Treasurer: Dr. Joseph S. Haas, 111 N. Wabash Ave., Chicago 2
Time and Place: 7:30 p.m., first or third Monday of each month, October-May; Chicago-Illini Union, 715 S. Wood St.

Indiana

INDIANA ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. Hugh Kuhn
Secretary: Dr. John J. Flick, 1443 N. Pennsylvania St., Indianapolis
Time: Annually in May

INDIANAPOLIS OPHTHALMOLOGICAL AND OTOLARYNGOLOGICAL SOCIETY

President: Dr. John J. Flick
Secretary: Dr. M. Richard Harding, 23 East Ohio St., Indianapolis 4
Time and Place: 6:30 p.m., second Thursday of each month during Winter; Athletic Club

Iowa

IOWA ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. William C. Huffman
Secretary: Dr. Arthur C. Wise, 212 Savings and Loan Bldg., Iowa City

DES MOINES ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. Robert P. Updegraff
Secretary: Dr. J. H. McNamee, 306 Equitable Bldg., Des Moines
Time and Place: Fourth Monday of each month; Des Moines Club

Kansas

KANSAS STATE MEDICAL SOCIETY, SECTION ON OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. Max S. Lake
Secretary: Dr. Glen Floyd, Snyder Clinic, Winfield
Time and Place: May 1958; Kansas City, Kansas

Kentucky

LOUISVILLE EYE AND EAR SOCIETY

President: Dr. Charles L. Bloch
Secretary: Dr. George I. Uhde, 610-613 Brown Bldg., Louisville 2

Louisiana

NEW ORLEANS GRADUATE MEDICAL ASSEMBLY

President: Dr. Charles L. Brown
Secretary: Dr. Maurice E. St. Martin, 1430 Tulane Ave., New Orleans 12
Time and Place: March 3-6, 1958; Roosevelt Hotel, New Orleans

Maryland

MARYLAND SOCIETY FOR THE PREVENTION OF BLINDNESS

President: Dr. Frederic M. Reese
Secretary: Charles G. Page, 714 Park Avenue, Baltimore 1

BALTIMORE CITY MEDICAL SOCIETY, OPHTHALMOLOGICAL SECTION

President: Dr. Charles E. Iliff
Secretary: Dr. William Marr, 10 E. Chase St., Baltimore 2
Time and Place: October 1957; Johns Hopkins Club, Johns Hopkins Campus

BALTIMORE EAR, NOSE AND THROAT SOCIETY

President: Dr. Alvin P. Wenger
Secretary: Dr. Jerome Snyder, 11 E. Chase St., Baltimore 2
Time and Place: 1958; Johns Hopkins Club, Homewood

Massachusetts

MASSACHUSETTS MEDICAL SOCIETY, SECTION ON OPHTHALMOLOGY AND OTOLARYNGOLOGY

Chairman: Dr. Arthur J. Gorney
Secretary: Dr. John E. McKeigue, 94 Pleasant St., Arlington
Time and Place: May 1958; Boston

BOSTON CITY HOSPITAL AURAL AND OPHTHALMIC SOCIETY

President: Dr. Albert E. Sloane
Secretary: Dr. Thomas P. White, 520 Commonwealth Ave., Boston

Michigan

MICHIGAN STATE MEDICAL SOCIETY, SECTION ON OPHTHALMOLOGY AND OTOLARYNGOLOGY

Chairman: Dr. Bernard C. Wildgen (Ophthalmology)
Secretary: Dr. Henry A. Dunlap, 7815 E. Jefferson, Detroit 14 (Ophthalmology)
Co-Chairman: Dr. Walter K. Locklin (Otolaryngology)
Co-Secretary: Dr. Harry L. LeVett, 117½ W. Shiawassee, Lansing (Otolaryngology)
Time and Place: September 25-27, 1957; Grand Rapids

MICHIGAN TRIOLOGICAL SOCIETY

President: Dr. Max Finton
Secretary: Dr. Carl Gardner, 1410 American National Bank Bldg., Kalamazoo
Time and Place: Four times each year; various places

DETROIT OPHTHALMOLOGICAL CLUB

Secretary: Dr. John W. Henderson, Room 6155 Out Patient Bldg., University Hospital, Ann Arbor
Time and Place: Second Monday in November, December, February, and March; Wayne County Medical Society

DETROIT OPHTHALMOLOGICAL SOCIETY

President: Dr. Harold F. Falls
Secretary: Dr. James Olson, 1005 Mutual Bldg., 28 W. Adams, Detroit
Time and Place: 8:00 p.m., fourth Thursday of each month; The Harmonie Club, 267 E. Grand River

DETROIT OTOLARYNGOLOGICAL SOCIETY

President: Dr. Lyle G. Waggoner
Secretary: Dr. James E. Coyle, 573 Fisher Bldg., Detroit 2
Time and Place: 6:30 p.m., third Wednesday of each month; David Whitney House

SAGINAW VALLEY ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. Hugh K. Cook
Secretary: Dr. Arno W. Weiss, 308 Eddy Bldg., Saginaw
Time and Place: First Tuesday of each month; Bancroft Hotel, Saginaw

Minnesota

MINNESOTA ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. Kinsey Simonton
Secretary: Dr. Malcolm A. McCannel, 325 Doctors Bldg., Minneapolis 2
Time and Place: 6:00 p.m., second Friday of each month, October-May; Alternating between Minnesota Club, St. Paul and the Minneapolis Club, Minneapolis

Missouri

KANSAS CITY SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. Clarence Steele
Secretary: Dr. J. T. Robison, 4620 J. C. Nichols Parkway, Kansas City
Time: Third Thursday of each month, November-May

EAR, NOSE AND THROAT CLUB OF ST. LOUIS

Chairman: Dr. L. W. Dean, Jr.
Secretary: Dr. Harry N. Glick, 1504 South Grand Blvd., St. Louis 4
Time and Place: Third Wednesday in November, January, March and May; University Club

ST. LOUIS OPHTHALMOLOGICAL SOCIETY

President: Dr. Ben Milder
Secretary: Dr. Lawrence T. Post, Jr., 100 N. Euclid, St. Louis 8
Time and Place: 5:30 p.m., fourth Thursday in October, November, January, February, March and April; Park Plaza Hotel, 220 N. Kingshighway

Montana

MONTANA ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. Robert M. Morgan
Secretary: Dr. James D. Morrison, P.O. Box 1856, 1241 N. Broadway, Billings
Time and Place: Annual meeting with the Montana Medical Society, September 18-20, 1957; Missoula

Nebraska

NEBRASKA ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. John C. Peterson
Secretary-Treasurer: Dr. Paul L. Peterson, 702 Sharp Bldg., Lincoln
Time: October 1957

OMAHA EYE, EAR, NOSE AND THROAT SOCIETY

President: Dr. Frank Eagle
Secretary: Dr. John Filkins, 521 The Doctors Bldg., Omaha
Time and Place: 6:30 p.m., third Wednesday of each month, Omaha Club, 20th & Douglas St., Omaha

New Jersey

ACADEMY OF MEDICINE OF NEW JERSEY, EYE, EAR, NOSE AND THROAT SECTION

Chairman: Dr. Elliot Ringler
Secretary: Dr. Francis Christoph, 811 Chestnut St., Union

MEDICAL SOCIETY OF NEW JERSEY, SECTION ON OPHTHALMOLOGY

President: Dr. John Scillieri
Secretary: Dr. Samuel M. Diskan, 1616 Pacific Ave., Atlantic City

NEW JERSEY ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. J. Wallace Hurff
Secretary: Dr. John Scillieri, 660 Broadway, Paterson
Time and Place: November 13, 1957; Princeton Inn, Princeton

NEW JERSEY OPHTHALMOLOGICAL SOCIETY

President: Dr. Irwin Levy
Secretary: Dr. Alfonse Cinotti, 3285 Hudson Blvd., Jersey City
Time and Place: November 1957; Princeton. May 1958; Atlantic City

NEW JERSEY SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. Edgar P. Cardwell
Secretary: Dr. Albert F. Moriconi, 438 Hamilton Ave., Trenton 9

HUDSON COUNTY EYE, EAR, NOSE AND THROAT SOCIETY

President: Dr. A. A. Cinotti
Secretary: Dr. N. J. Shapiro, 1201 Palisade Ave., Union City
Time and Place: 9:00 p.m., third Monday of each month, November-June; Pete Dominicks Restaurant, Jersey City

New Mexico

NEW MEXICO OPHTHALMOLOGICAL SOCIETY

President: Dr. Albert W. Egenhofer
Secretary: Dr. J. A. Dillahunt, 106 Girard Blvd. S.E., Albuquerque

New York

NEW YORK ACADEMY OF MEDICINE, SECTION ON OPHTHALMOLOGY

President: Dr. Arthur G. DeVoe
Secretary: Dr. Hunter H. Romaine, 111 E. 65th St., New York 21
Time and Place: 8:15 p.m., third Monday of each month, September-May; New York Academy of Medicine, 103rd and 5th Ave., New York City

NEW YORK ACADEMY OF MEDICINE, SECTION ON OTOLARYNGOLOGY

Chairman: Dr. Ernest A. Weymuller
Secretary: Dr. Richard J. Bellucci, 162 E. 71st St., New York 21
Time: Third Wednesday of each month

NEW YORK SOCIETY FOR CLINICAL OPHTHALMOLOGY

President: Dr. Max Chamlin
Secretary: Dr. Leon H. Ehrlich, 211 Central Park West, New York 24
Time and Place: 8:00 p.m., first Monday of the month; New York Academy of Medicine, 2 E. 103rd St.

CENTRAL NEW YORK EYE, EAR, NOSE AND THROAT SOCIETY

President: Dr. Charles A. Prudhon
Secretary: Dr. O. W. Oberlander, Jr., 301 State Tower Bldg., Syracuse
Time and Place: February, May, August and November; The University Club, Syracuse

EASTERN NEW YORK EYE, EAR, NOSE AND THROAT SOCIETY

President: Dr. Benjamin M. Volk
Secretary-Treasurer: Dr. Frank C. Furlong, 713 Union St., Schenectady
Time and Place: 7:00 p.m., first Thursday, November-April; alternating at Albany, Troy and Schenectady

ALUMNI ASSOCIATION OF THE NEW YORK EYE AND EAR INFIRMARY

President: Dr. Daryl Voorhies
Secretary: Dr. Alfonse Cinotti, 3285 Hudson Blvd., Jersey City
Time and Place: October 1957, Chicago; Spring 1958, New York City

BROOKLYN OPHTHALMOLOGICAL SOCIETY

President: Dr. B. M. Volk
Secretary: Dr. Frank C. Furlong, 713 Union St., Schenectady
Time and Place: Third Thursday in October, December, February, and April; Kings County Medical Society, 1313 Bedford Ave., Brooklyn

BUFFALO OPHTHALMOLOGICAL CLUB

President: Dr. Elizabeth P. Olmsted
Secretary-Treasurer: Dr. Harold E. Wass, 840 West Delevan Ave., Buffalo 9
Time and Place: 7:00 p.m.; Buffalo

NASSAU OPHTHALMOLOGICAL SOCIETY

President: Dr. Eugene T. Buckley
Secretary-Treasurer: Dr. Arthur E. Merz, 520 Franklin Ave., Garden City, L. I.
Time and Place: Fourth Monday, February, April, September and November; at various places

North Carolina

NORTH CAROLINA EYE, EAR, NOSE AND THROAT SOCIETY

President: Dr. E. J. Chapman
Secretary: Dr. James D. Stratton, 1012 Kings Drive, Charlotte 7
Time: Second week in September, 1957

Ohio

AKRON ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. F. R. Souers
Secretary: Dr. D. W. Mathias, 819 First National Tower, Akron 8
Time and Place: 6:30 p.m., first Monday of October, December, February, and May; Akron City Club

CINCINNATI OPHTHALMOLOGIC CLUB

Presidium: Dr. Donald J. Lyle, Dr. Charles K. W. Ascher, Dr. Barnet Sakler
Secretary: Dr. Josef D. Weintraub, 715 Provident Bank Bldg., Cincinnati 2
Time and Place: 8:00 p.m., second Wednesday, November-May; Vernon Manor Hotel

CINCINNATI OTOLARYNGOLOGIC SOCIETY

President: Dr. Harry H. Haggart
Secretary: Dr. Joseph A. Lane, 614 Doctors Bldg., Cincinnati
Time and Place: Fourth Monday of each month; University Club

CLEVELAND OPHTHALMOLOGICAL CLUB

President: Dr. Thayer L. Parry
Secretary: Dr. Herman C. Weinberg, 2177 S. Taylor, Union Heights
Time and Place: Four times yearly; Wade Park Manor, 107th St. and Park Lane, Cleveland

CLEVELAND OTOLARYNGOLOGICAL CLUB

President: Dr. Harold E. Harris
Secretary-Treasurer: Dr. Thomas L. Smith, 301 Broadway Bldg., Lorain
Time and Place: 6:30 p.m., Wednesday of each month; Wade Park Manor, 107th St. and Park Lane, Cleveland

COLUMBUS SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. T. A. Makley, Jr.
Secretary: Dr. Carl W. Roth, 22 Buttles Ave., Columbus 8
Time and Place: 6:00 p.m., first Monday of each month, October-May; University Club, Columbus

TOLEDO EYE, EAR, NOSE AND THROAT SOCIETY

President: Dr. Henry P. Drake
Secretary: Dr. A. James Blanchard, 723 Phillips Ave., Toledo
Time and Place: 6:30 p.m., third Tuesday of each month; Toledo Club

Oklahoma

OKLAHOMA CITY ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. Robert I. Trent
Secretary: Dr. Jack V. Hough, 301 N. W. 12th, Oklahoma City

Oregon

OREGON ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. Ralph N. Westfall
Secretary: Dr. Charles W. Browning, 919 Taylor St. Bldg., Portland 5
Time and Place: Fourth Tuesday, September-May; Henry Thiele Restaurant, 23 and West Burnside, Portland

Pennsylvania

PENNSYLVANIA ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. Josiah F. Buzzard
Secretary: Dr. Daniel S. De Stio, 1006 Highland Bldg., Pittsburgh 6
Time and Place: May 22-24, 1958; Bedford Springs Hotel, Bedford

WESTERN PENNSYLVANIA EYE, EAR, NOSE AND THROAT SOCIETY

President: Dr. Daniel S. De Stio
Secretary-Treasurer: Dr. F. E. Murdock, 28½ W. Scribner Ave., DuBois
Time: Third Thursday, April-September

COLLEGE OF PHYSICIANS OF PHILADELPHIA, SECTION ON OPHTHALMOLOGY

President: Dr. Isaac S. Tassman
Secretary: Dr. William E. Krewson III, 1930 Chestnut St., Philadelphia 3
Time and Place: Third Thursday of every month, October-April; College of Physicians Bldg., 19 So. 22nd St., Philadelphia 3

PHILADELPHIA COUNTY MEDICAL SOCIETY, EYE SECTION

Chairman: Dr. Robert H. Trueman
Secretary: Dr. Thomas H. Cowan, 1930 Chestnut St., Philadelphia 3
Time and Place: First Thursday, November-April; Philadelphia County Medical Society Bldg., 301 S. 21st St., Philadelphia

PHILADELPHIA LARYNGOLOGICAL SOCIETY

President: Dr. Chevalier L. Jackson
Secretary: Dr. Louis E. Silcox, Lankenau Medical Bldg., Philadelphia 31
Time and Place: First Tuesday of each month; College of Physicians Bldg., 19 S. 22nd St., Philadelphia

PITTSBURGH OPHTHALMOLOGICAL SOCIETY

President: Dr. Robert F. Rohm
Secretary: Dr. William G. Everett, 407 Jenkins Bldg., Pittsburgh 22
Time and Place: 8:00 p.m., third Monday of each month; Mellon Institute

PITTSBURGH OTOLOGICAL SOCIETY

President: Dr. Raymond E. Jordan
Secretary: Dr. John T. Dickinson, Mercy Hospital, Pittsburgh 19
Time and Place: 6:00 p.m., each month; Park Schenley Restaurant, Pittsburgh

READING EYE, EAR, NOSE AND THROAT SOCIETY

President: Dr. Samuel A. Phillips
Secretary: Dr. James H. Parker, Jr., 238 N. 5th St.
Time and Place: Third Wednesday, September-May; Wyomissing Club, Reading

WYOMING VALLEY EYE, EAR, NOSE, AND THROAT CLUB

President: Dr. W. C. Marsden
Secretary: Dr. Albert J. Abbott, 203 E. Green St., Nanticoke
Time and Place: Last Tuesday, October-April; Luzerne County Medical Society Bldg., S. Franklin St., Wilkes-Barre

South Carolina

SOUTH CAROLINA SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. James H. Gressette
Secretary-Treasurer: Dr. Roderick Macdonald, 330 E. Main St., Rock Hill
Time and Place: September, 1957, (Jointly with N.C.E.E.N.T. Society)

Tennessee

TENNESSEE STATE ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. Hurbert Duncan
Secretary: Dr. Thomas Bryan, 2105 Hayes St., Nashville
Time and Place: 1957; Nashville

CHATTANOOGA AND HAMILTON COUNTY EYE, EAR, NOSE AND THROAT SOCIETY

Chairman and Secretary: Dr. I. L. Arnold, 702 Medical Arts Bldg., Chattanooga
Time and Place: 6:30 p.m., second Thursday in each month, Mountain City Club

KNOXVILLE SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. Walter H. Benedict
Secretary: Dr. J. E. Campbell, Jr., 406 W. Church Ave.
Time and Place: 6:30 p.m., first Monday of each month, September-May; Hotel Farragut

MEMPHIS SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

Chairman: Each member in alphabetical order
Secretary: Dr. William F. Murrah, 1720 Exchange Bldg., Memphis 3
Time and Place: 8:00 p.m., second Tuesday of each month; Memphis Eye, Ear, Nose and Throat Hospital, 1060 Madison Ave.

NASHVILLE ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

President: Dr. G. Allen Lawrence
Secretary-Treasurer: Dr. J. Ralph Rice, 426 Bennie Dillon Bldg.
Time and Place: 6:00 p.m., third Monday of each month, October-May; James Robertson Hotel

Texas

Texas Society of Ophthalmology and Otolaryngology

President: Dr. Lyle Hooker
Secretary: Dr. Edwin G. Grafton, 8215 Westchester, Dallas
Time and Place: December 6 and 7, 1957; Austin

Dallas Academy of Ophthalmology and Otolaryngology

President: Dr. Ludwig A. Michael
Secretary: Dr. Edward A. Newell, 1511 N. Beckley, Dallas 8
Time and Place: First Tuesday of each month, October-June; Dallas 1

Fort Worth Eye, Ear, Nose and Throat Society

President: Dr. Walter P. Anthony
Secretary: Dr. William Hendrix, 1216 Pennsylvania Ave.
Time and Place: 6:00 p.m., first Friday of each month; St. Joseph Hospital

Houston Academy of Medicine, Ophthalmological and Otolaryngological Sections

President: Dr. Jacob F. Schultz
Secretary: Dr. Frederick R. Guilford, 509 Hermann Professional Bldg., Houston 25
Time and Place: 6:30 p.m., second Thursday of each month; The Doctors' Club

San Antonio Society of Ophthalmology and Otolaryngology

President: Dr. I. Newton Watson
Secretary: Dr. J. L. Mims, Jr., 211 Medical Arts Bldg., San Antonio 5
Time and Place: Third Tuesday of each month; San Antonio Country Club

Virginia

Virginia Society of Ophthalmology and Otolaryngology

President: Dr. Ben Sheppard
Secretary: Dr. Maynard P. Smith, 600 Professional Bldg., Richmond

Richmond, Virginia, Eye, Ear, Nose and Throat Society

President: Dr. Edmund M. LaPrade
Secretary: Dr. Charles N. Romaine, IV, 1001 W. Franklin St., Richmond 20
Time and Place: Second Tuesday of January, first Tuesday of March, May and October; Commonwealth Club

Tidewater Ophthalmological and Otolaryngological Society

President: Dr. John Sellers
Secretary: Dr. J. A. Klotz, 905 Wainwright Bldg., Norfolk, Va.
Time: October, February, and May

Washington

Washington State Medical Association, Section on Eye, Ear, Nose and Throat

President: Dr. George H. Drumheller
Secretary-Treasurer: Dr. Claude K. Miller, 601 Douglas St., Wenatchee
Time and Place: September 1957; Olympic Hotel, Seattle

Puget Sound Academy of Ophthalmology and Otolaryngology

President: Dr. E. DeMar Anderson
Secretary: Dr. Willard F. Goff, 1215 Fourth Ave., Seattle 1
Time and Place: Third Tuesday of February, March, April, May, October and November; usually in Seattle

Spokane Academy of Ophthalmology and Otolaryngology

President: Dr. Clarence A. Veasey, Jr.
Secretary: Dr. William C. Richter, 820 S. McClellan
Time and Place: 8:00 p.m., fourth Tuesday of each month; Blood Bank Bldg., Fifth and Washington Sts.

Washington, D. C.

Section on Ophthalmology of the Medical Society of the District of Columbia

President: Dr. Robert E. DuPrey
Secretary: Dr. Marshall M. Parks, 2129 Bancroft Place, N. W., Washington 8
Time: Quarterly

Section on Otolaryngology of the Medical Society of the District of Columbia

President: Dr. Russel S. Page, Jr.
Secretary: Dr. Edward M. O'Brien, 1835 Eye St., N. W.
Time and Place: Second Tuesday of every other month, September-May; Army-Navy Club

West Virginia

West Virginia Academy of Ophthalmology and Otolaryngology

President: Dr. William F. Beckner
Secretary-Treasurer: Dr. William K. Marple, 400 First Huntington and National Bank Bldg., Huntington
Time and Place: August 1957; The Greenbrier, White Sulphur Springs, in conjunction with the West Virginia Medical Association

Wisconsin

Madison, Wisconsin, Eye, Ear, Nose and Throat Society

President: Dr. Peter A. Duehr
Secretary: Dr. Edward F. Purcell, 110 E. Main St., Madison
Time and Place: 6:15 p.m., first Tuesday of each month; Madison Club

Milwaukee Oto-Ophthalmic Society

President: Dr. E. Franklin Carl
Secretary: Dr. Lee Eby, 324 E. Wisconsin Ave., Milwaukee
Time and Place: 6:30 p.m., fourth Tuesday of each month; University Club

HAVE YOU CHANGED YOUR ADDRESS?

To ensure uninterrupted delivery of your TRANSACTIONS, please return this coupon or send the same information on a post card to
American Academy of Ophthalmology and Otolaryngology
15 Second St. S.W., Rochester, Minnesota

Name.....

PLEASE PRINT

FORMER ADDRESS:	NEW ADDRESS:
Street.....	Street.....
City.....	City.....
Zone.....State.....	Zone.....State.....

For countries outside the United States:

.....

NAME OF COUNTRY